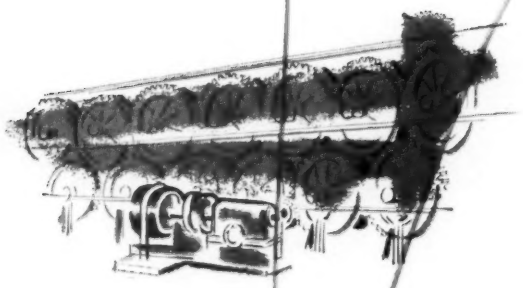
- Champion's No. 20 machine
- Pipe, fittings, valves and pumps in pulp washing and screening
- Sodium silicate adhesives
- Multiwall bag manufacture

The Paper Industry



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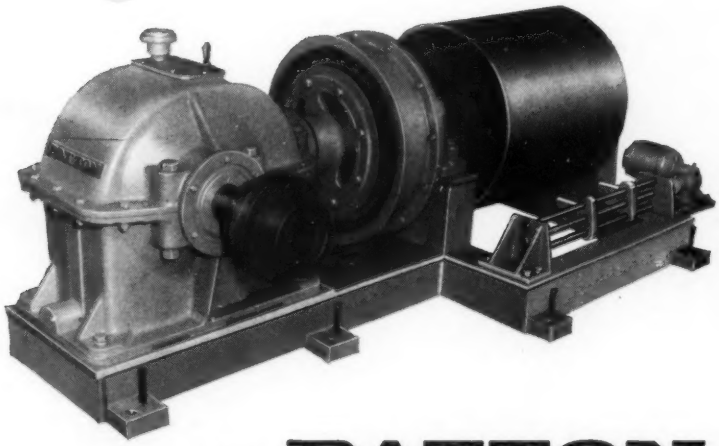

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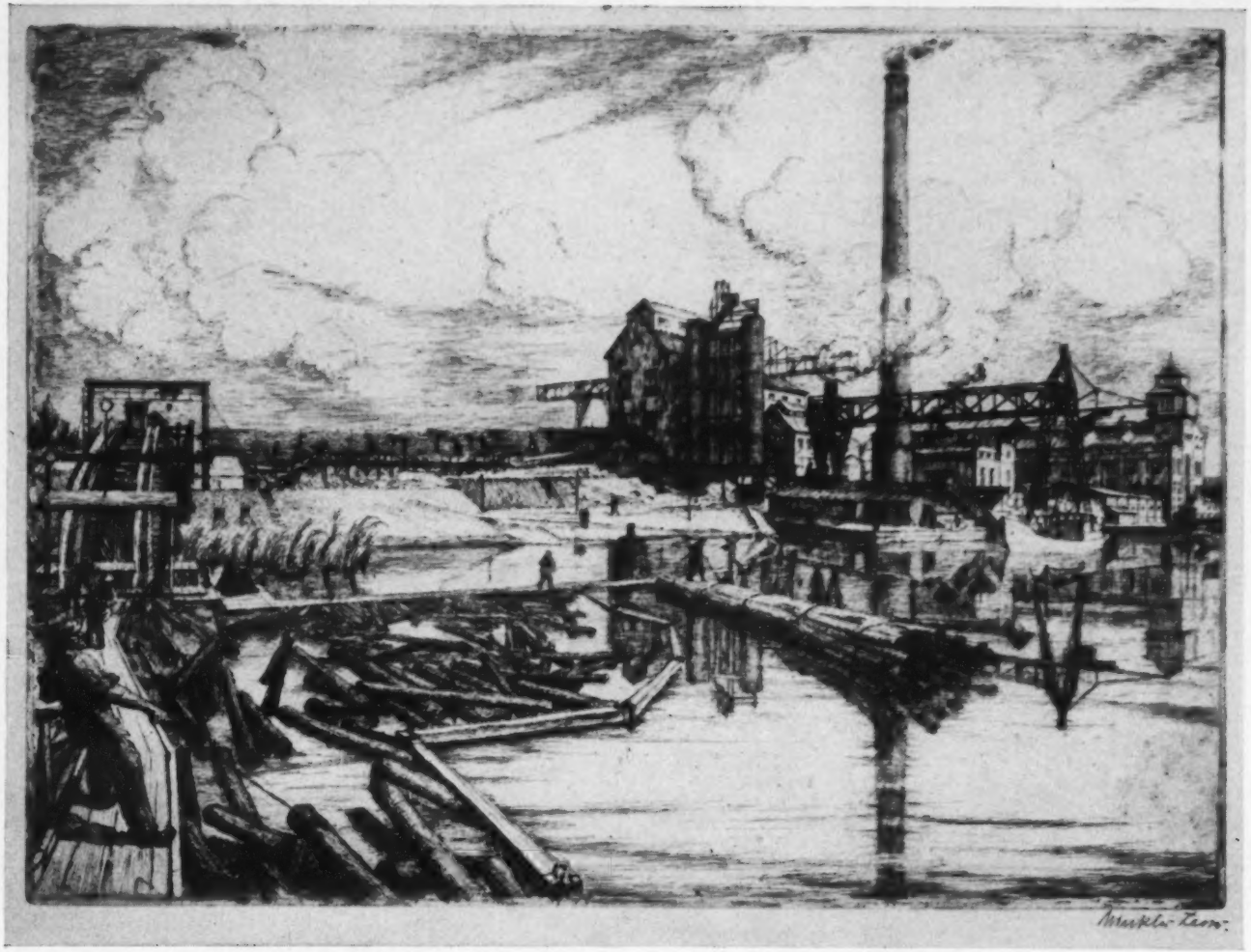

"Log Harbor" **Original etching by Paul Winkler-Leers from the Asten-Hill collection.**

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What do you see in this quiet picture?

❶ Is it a "still" ( ) or an action photo? ( )

❷ Are the men working?
Yes ( ) No ( )

❸ Which is the parent roll?
Left ( ) or Right ( )

❹ See any movement? Look closely!
Yes ( ) No ( )

❺ Machine-day is 8 hrs ( )
12 hrs ( ) 24 hrs ( )

❶ The papermaking process doesn't stop for candid photographs. If you checked "action" you're right. The winder has just started a new run. In a few seconds the winding speed will be well over a mile a minute.

❷ That three-man crew is working! Their watchful attitude tells you that the winding operation is completely automatic. Every 8 minutes the crew unloads (automatically) and starts a new 7,000 lb. roll. They're watching the slitter units, web tension, and winder speed, and are ready when necessary to make instant automatic adjustments at the control panels.

TEST YOUR POWERS OF OBSERVATION

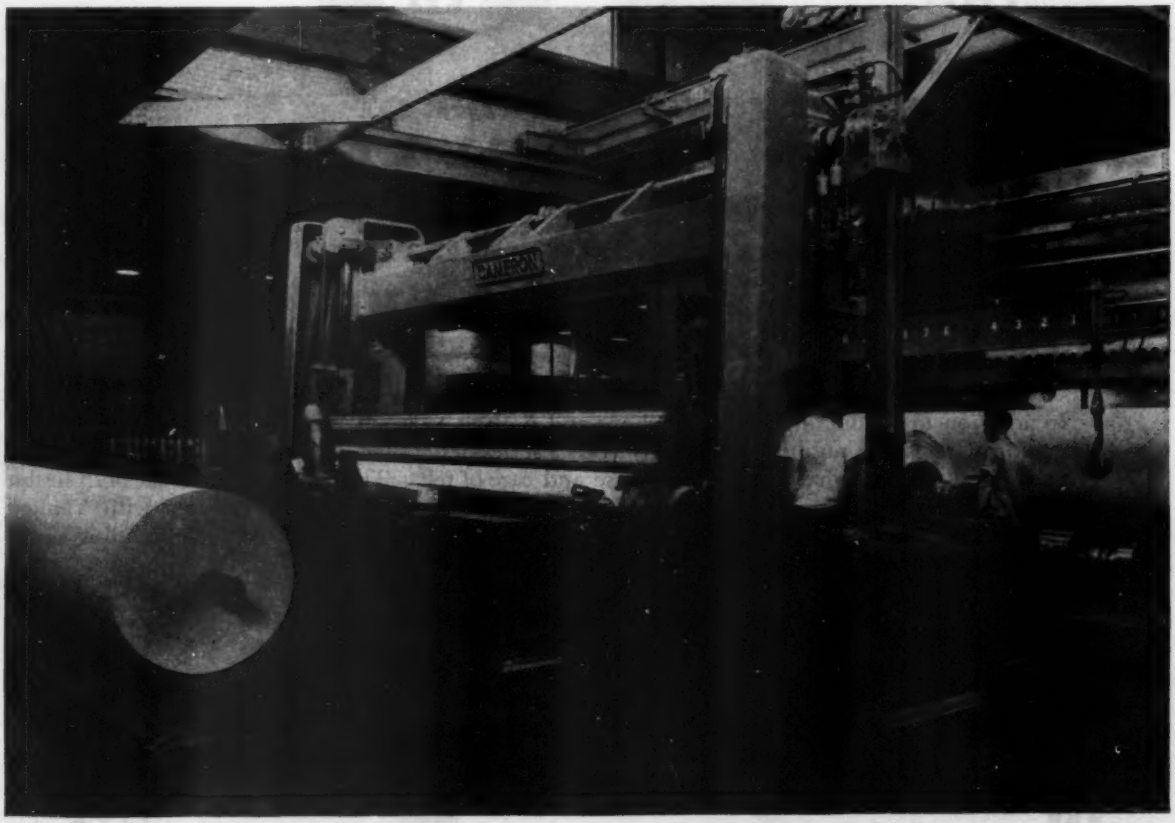
The unretouched candid photograph reproduced below was made at Southland Paper Mills, Lufkin, Texas by a UPI photographer. What you see in it depends on how well you know your winders. Read the questions, then check your answers in the numbered paragraphs.

❸ The parent roll is at the right. You can recognize it by the rough telescoping of its side. The finished roll at the left was unloaded seconds ago. You can tell by the exceptionally smooth, flat side *(unretouched)* that it is a perfect roll, uniformly wound from core to circumference. Cameron Imperial Winders are built to produce perfect rolls every time, automatically.

❹ You probably saw the slight blur as the control operator moved his left hand. The winder is sharp in every detail because there is no vibration. Performance is just as quiet as it looks, even at top speeds with a full payload. The dynamic thrust of almost three tons of paper winding at well over a mile a minute is tamed by the perfect balance, fine engineering, skilled craftsmanship and rugged construction of the winder.

❺ Twenty-four hours is "right" in every busy paper mill. The only change is in the crews. Cameron Imperial Winders are built to stay on the job 24 hours a day at speeds well ahead of the peak requirements of any mill.

THE NAME at the top of the machine tells you it's the fastest winder in the world—the Cameron Imperial—now available with speeds up to 8,000 fpm on newsprint, rewind diameters up to 72", pneumatic score-cut or shear-cut slitting, and automatic controls. If you are interested in fast, low-cost production of better newsprint, paper or paperboard rolls, why not consult with the Cameron Team of Specialists?



AA-365

Cameron Machine Company, Franklin Road, Dover, N. J.
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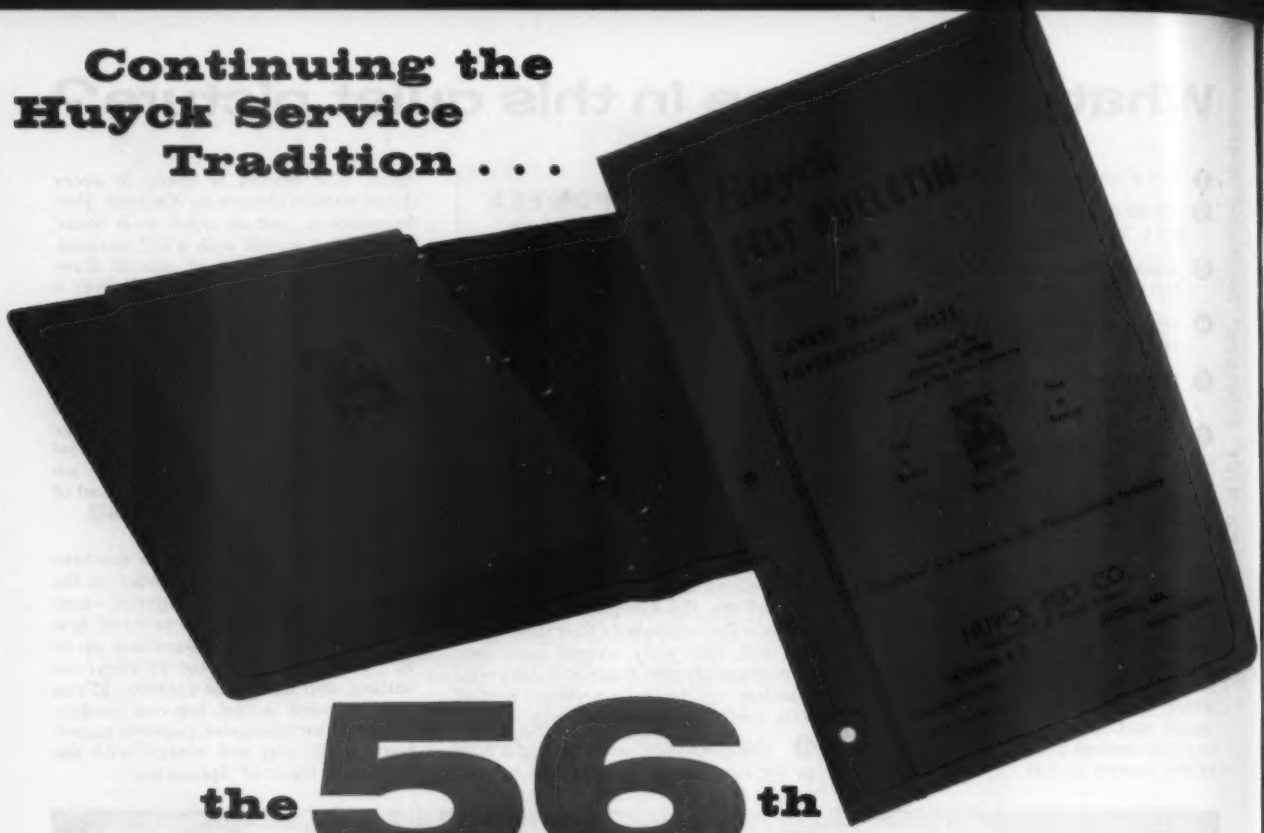

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The Paper Industry

Technology • Engineering • Management • Production

VOLUME 41 **NUMBER 5** **AUGUST 1959**

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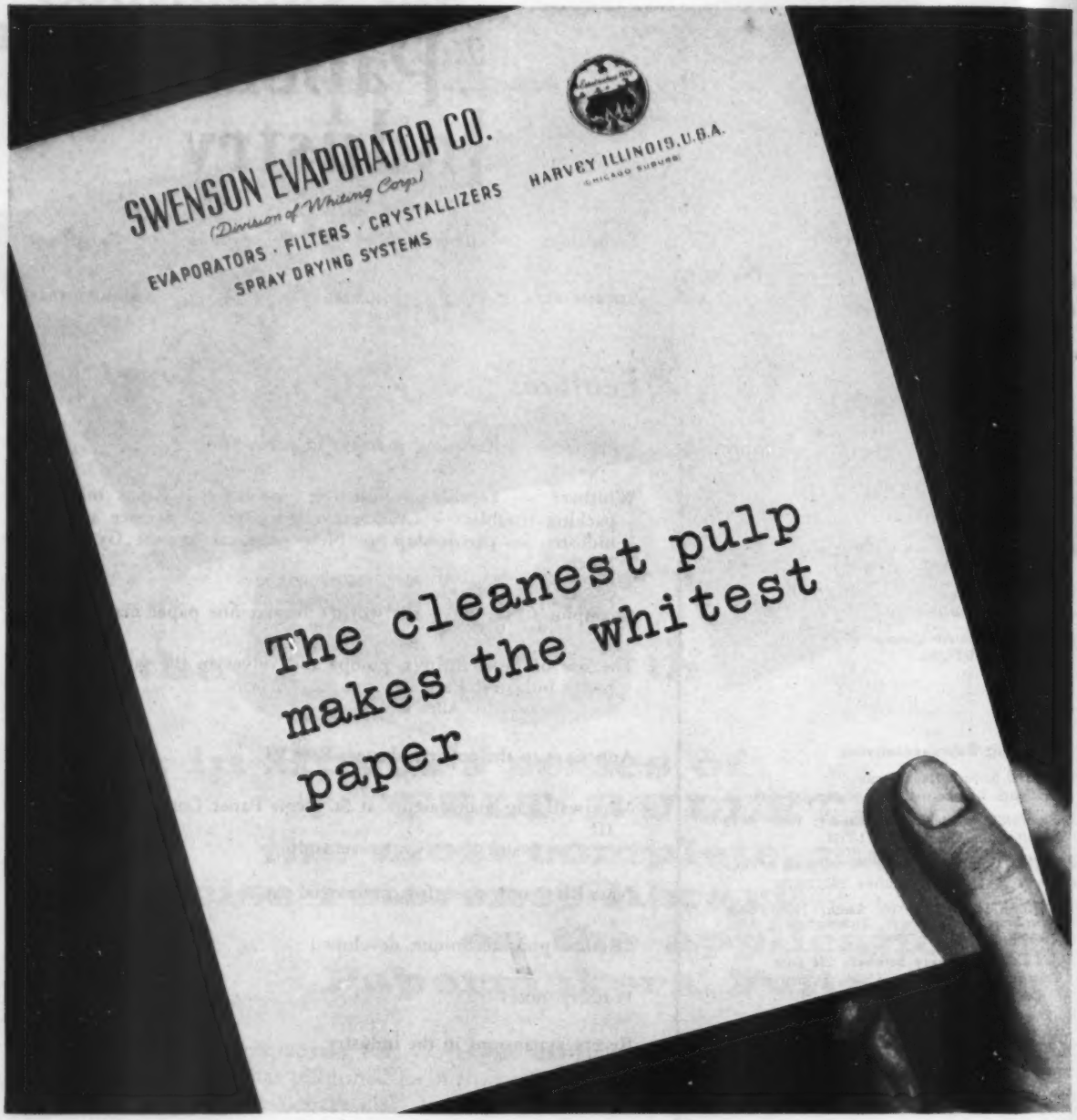
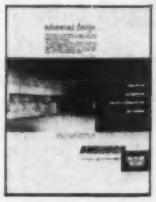
The PAPER INDUSTRY is indexed regularly in **Engineering Index** and **Industrial Arts Index.** An index to each volume is issued annually by the publisher as a part of the April number. © 1959 by Fritz Publications, Inc.



Clean pulp is a basic requirement for economical bleached pulp and white paper production. Swenson pulp washers provide this clean pulp—and produce it with an extremely low dilution of the recovered black liquor. As a result, both bleaching costs and chemical recovery costs are held to a minimum. These operating advantages are backed by proven mechanical reliability and such features as self-aligning roller bearings and high strength deck construction. Specify Swenson pulp washing equipment.



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From our point of view..

Science and industry in partnership

We have repeatedly emphasized the tremendous contribution made by science and technology to the strength of the country's industry, economy and the welfare of its people.

It is therefore, with pleasure, that we take this opportunity to comment on a lecture entitled "Industrial Forces in Science" presented by Samuel Lenher of Du Pont as part of the Contemporary Trends Course at the University of Wisconsin.

The current accelerated rate of progress throughout the world, and particularly in the U.S.A., is a direct result of scientific discoveries and their rapid translation by industry into technology and useful products of benefit to mankind. In turn, as pointed out by Mr. Lenher, "nearly every advance in technology suggests to science a further trail to be explored".

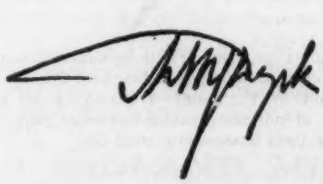
Science and industry are thus continuously energizing each other, each complementing and supplementing the other in a partnership that is creative, practical and profitable. Any new discovery in the laboratory, no matter how important scientifically, is of little value to mankind unless it can be made to serve a useful purpose by industry.

Today, more than ever, industry is turning to science in its search for ways to operate at a profit, because businessmen have found out that research really pays off. Industry's continued objective remains to produce more, better and at a lower cost, or in other words to improve its productivity.

"What is important to keep in mind", says Mr. Lenher, "is that the increase in productivity of which we are so justly proud did not come about because people began working harder, but because industry made use of science to develop energy, machines, products and processes which enable fewer people to produce more and better things with less physical labor".

We can be quite sure that the credit for a new era of prosperity in the 60's that will bring with it a national economy of unprecedented abundance will go to the tremendous acceleration of scientific research, that was characteristic of a decade that is now coming to a close, and not so much to various surveys establishing preferences or trends for the acceptance of new products and their uses.

Along with the accelerating trend toward partnership between science and industry is a strong need for improved communication efforts that will explain and interpret this partnership to the industry and the public, and allay many of the fears and suspicions in connection with some of the social problems this partnership will entail.



Why Hunter Packing Company uses STANOIL Industrial Oil

Two reasons: (1) STANOIL is a superior oil. (2) Along with STANOIL, Hunter Packing receives experienced lubrication technical service.

A special antioxidant in STANOIL gives the oil resistance to *chemical* change. Deposits are minimized. The oil has a high viscosity index, is resistant to *temperature* change. It lubricates effectively at both high and low temperatures. Due to special refining techniques, STANOIL will not readily emulsify. A special additive minimizes foaming. STANOIL has a low pour point. It flows freely at low temperatures. A rust inhibitor in STANOIL "plates out" on metal surfaces.

W. P. "Sandy" Wehking, the Standard Oil man who calls on Hunter Packing Company, has plenty of experience in technical service work. He's been at it for 17 years. Sandy studied chemistry at Blackburn College. He has also completed the Standard Oil Sales Engineering School.

To get more information about STANOIL Industrial Oil and to obtain technical help on your lubrication problems, call the Standard Oil office near you in any of the 15 Midwest or Rocky Mountain states. Or write, **Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.**

Quick facts about
STANOIL Industrial Oil

- Antioxidant gives oil resistance to chemical change, minimizes deposits.
- Inhibitor "plates out" on metal surfaces, prevents corrosion.
- Receives special refining to eliminate emulsion problems. Contains additive to minimize foaming.
- High viscosity index. Resists temperature change.

You expect more from **STANDARD** *and you get it!*

Temperature check. Frank Persson of Hunter Packing Company and Standard Oil lubrication specialist W. P. "Sandy" Wehking inspect one of four compressors in Hunter plant that uses STANOIL Industrial Oil.

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After 170,000,000 gallons paper-plant bleach . . .

no corrosion in Saran Lined Pipe

This is the delivery end of a saran lined pipeline which carries a corrosive solution of chlorine dioxide bleach, 24 hours a day, seven days a week. The line transports the bleach liquor from storage tanks to a large pine pulp bleaching tower at the International Paper Company's Mobile, Alabama, plant. In the eight years this line has been in service, *there's not been a single failure in the Saran Lined Pipe.*

The plant also relies on Saran Lined Pipe to carry alum to a groundwood mill for pH control, and to carry waste acid salts to spray towers for soda and sulphur recovery. Because of the pipe's extreme resistance to corrosion and chemical activity; and because of its rigidity, which eliminates the need for continuous external support, International's engineers report they are ". . . enthusiastic . . ." about the use of Saran Lined Pipe.

For paper plants and for other chemical processing operations which require piping systems with extreme resistance to corrosion and chemical activity, Saran Lined Pipe is an ideal choice. Saran Lined Pipe, fittings, valves and pumps are available for systems operating from vacuum to 300 psi, from below zero to 200° F. They can easily be cut, fitted and modified without special equipment. For more information, write Saran Lined Pipe Company, 2415 Burdette Avenue, Ferndale, Michigan, Dept. 2286DN8.

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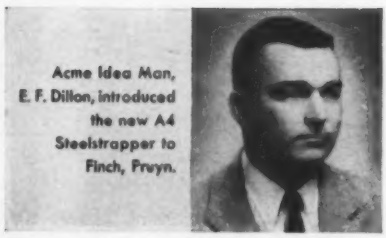

Acme Idea Man, E. F. Dillon, introduced the new A4 Steelstrapper to Finch, Pruyn.

Both the A4 and a reel of Acme Steel Strapping are mounted on a traveling hoist that can be moved over any part of the strapping floor . . . nothing to carry; nothing to cart around. The A4 is easily operated on top of high skids and in other difficult-to-reach places. It can be used on small flat surfaces because of its short strap base.

One hand operates the A4. The operator presses one control and strap is air-power tightened to a pre-determined tension. He presses another on the same handle, and magazine-fed seals are crimped and the strapping is cut . . . without waste, without effort!

***Check your Acme Idea Man** for a demonstration of the new A4 and full information on various overhead mounting systems. Call the nearest Acme Steel Company office or write: Dept. CS-89, Acme Steel Products Division, Acme Steel Company, Chicago 27, Ill. In Canada, Acme Steel Company of Canada, Ltd., 743 Warden Ave., Toronto 13, Ontario.

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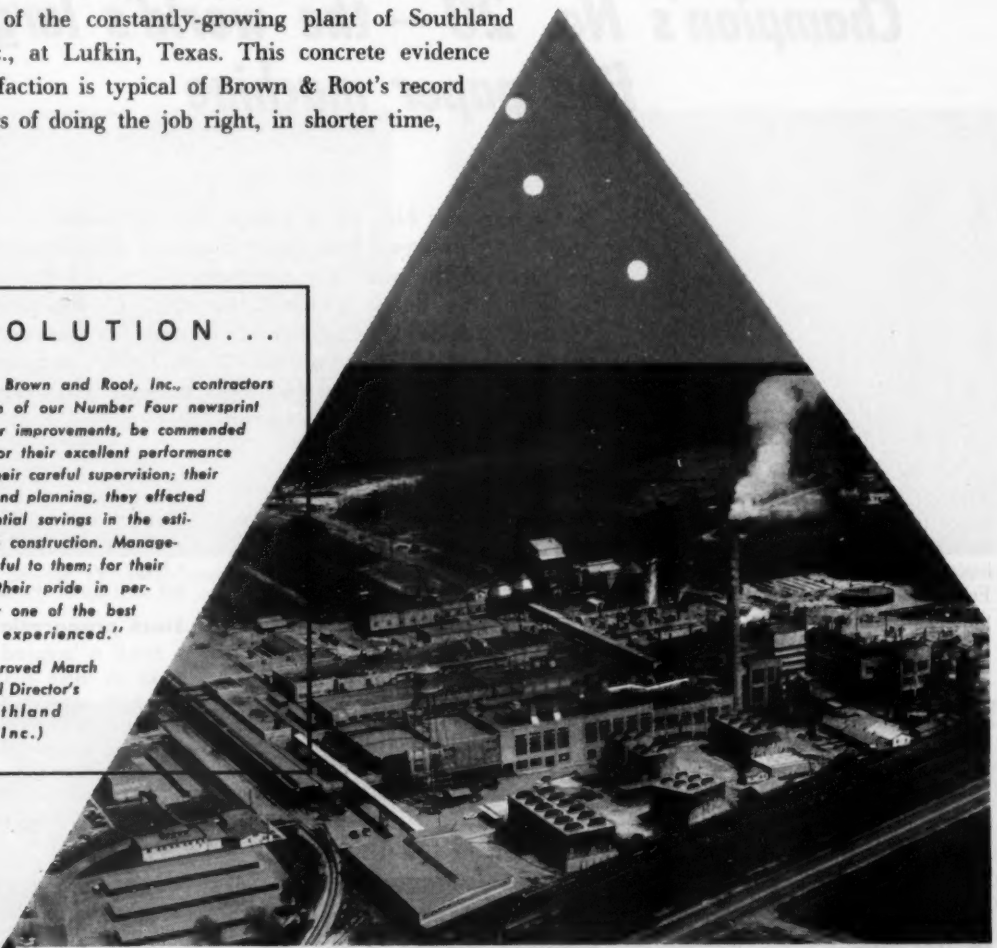
(Unanimously approved March 31, 1959 at annual Director's Meeting of Southland Paper Mills, Inc.)



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Feature articles

Champion's No. 20 — the world's largest fine paper machine

Champion's No. 20, a 246-in. Beloit machine, is claimed to be the world's largest fine-paper machine. Highlighting some unique features of the auxiliary equipment are: (1) the unique arrangement of the Bauer Centri-Cleaners, (2) the pressurized Black-Clawson Model 24-P selectifier screens for final screening and deflocculation, (3) the four new Nash 7208A vacuum pumps driven by a single motor, and (4) Ross Engineering's new Circlejector-equipped trim conveying system.

THE NEW 2000 fpm, 246-in. wide paper machine, which went into production at Champion Paper and Fibre's North Carolina Division last February, adds an annual capacity of 90,000 to 100,000 tons of fine papers to Champion's output. The Canton mill now produces 675 tons of paper and 225 tons of paperboard per day.

The new machine, incorporating many new ideas, was almost entirely designed by Champion engineers. Specifications were drawn up in close cooperation with Beloit engineers. No. 20 machine, as it is called, is claimed to be the world's largest machine for the manufacture of fine papers.

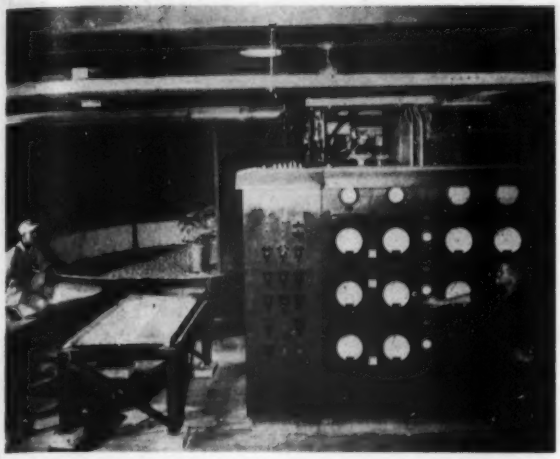
Cooperating in the design and construction of the new machine with B. J. Sledge, Champion's chief engineer for the No. 20 project, were H. T. Randall, Guy Randall, William Derby, Robert Forrest, C. A. Stone, Ray Foster, W. K. Stephens, J. C. Klopp, Carl Welte, J. B. Wilkinson, J. E. Hall and John Bull.

An extensive training program for the operators of No. 20 was initiated almost a year before the machine went into operation and was responsible in a large measure for the highly successful start-up of the machine.

Stock preparation

Stock is pumped from the storage tanks to three 6 ft. by 12 ft., 200-ton daily capacity Champion-designed thickeners and then to the three 20-ft. dia., 180 ton per day capacity Hydrapulpers where it is mixed with supplemental furnishes and bale pulp. The Hydrapulpers, operating on a 25-min-

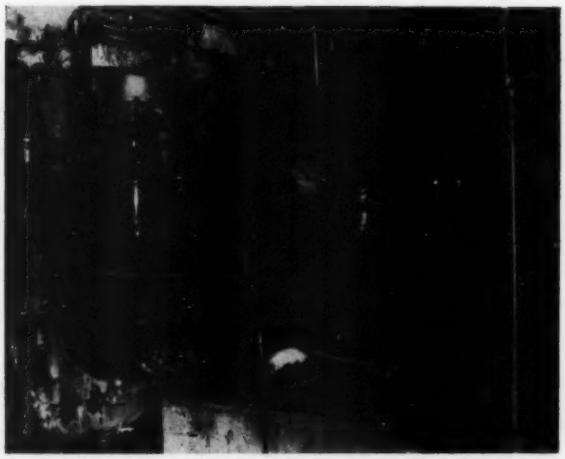
Reuben B. Robertson Jr. President | Reuben B. Robertson Chairman of the Board | A. M. Fairbrother V.P. & Carolina Div. Mgr. | Karl R. Bendetsen V. P. Pulp & Paper Mfg. | H. W. Suter Jr. V.P. Paper Sales | Dwight J. Thomson Exec. V.P. for Per. & P.R. | H. L. Lusby Mgr. No. 20 Machine



Black-Clawson 20-ft. dia., 180 tons/day capacity Hydrapulper, equipped with 96-in. rotors.

Champion-designed 6-x 12-ft., 200 ton/day capacity saveall thickener.

Bolton & Sons Inc., Emerson 4-K jordans equipped with Model 57 Duatrol units.

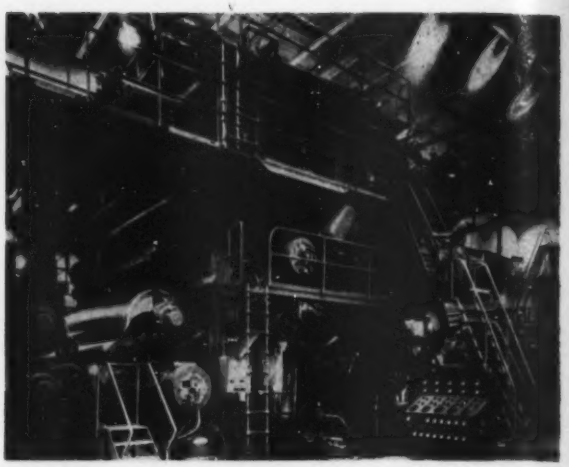


A Worthington Corp. 20 LA type pump pumps stock to the 36 Centri-Cleaners.

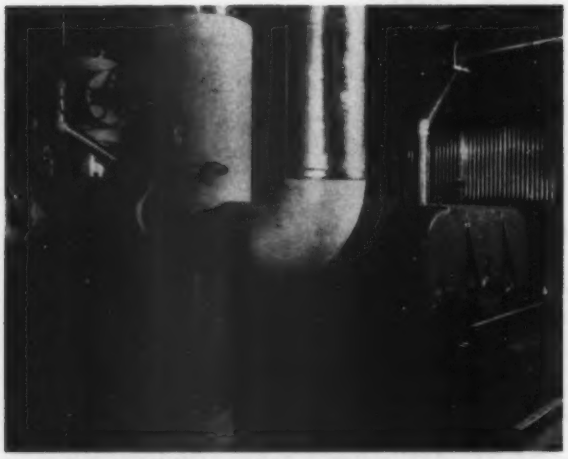
Bauer Bros. Centri-Cleaners equipped with vacuum reject receivers.

Black-Clawson Model 24-P totally enclosed, pressurized selectifier screens.

Beloit 245-in. wide paper machine — the largest fine-paper machine in operation.

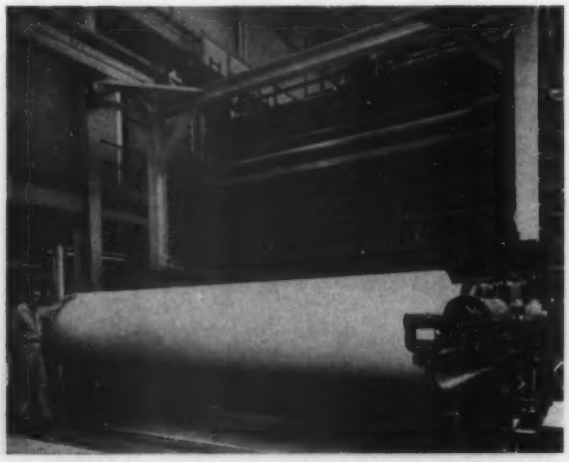


Beloit 27½-ft. high press section includes an inclined 3-roll press, a straight-through and a smoothing press.

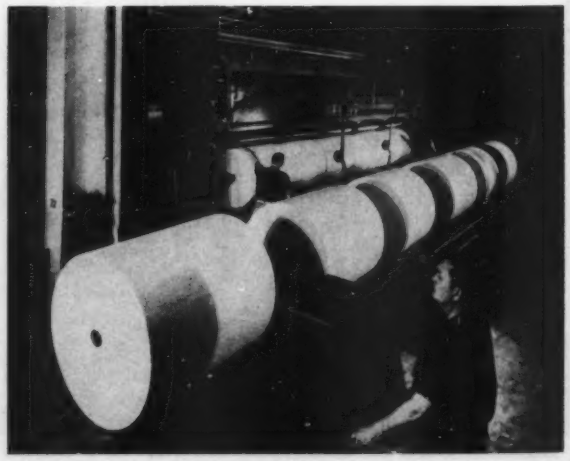


General Electric 2,400 hp. multi-vane, multi-stage steam turbine is the prime mover of the machine.

Nash Engineering new 7208A vacuum pumps are driven in line by a single motor.



Beloit calenders and constant speed reel featuring air-loaded reel arms.



Beloit Model-L double drum winder and complete roll conveying system.

Principal equipment and suppliers for Champion's No. 20 Machine

Stock preparation and refining

Centri-Cleaners (36), 29 primary No. 623-4 (650 gpm), five secondary No. 623 (500 gpm), and two tertiary No. 623 with vacuum reject receivers on the primaries and secondaries ..... Bauer Bros Co.
Centri-Cleaner pump, 20 LA type ..... Worthington Corp.
Consistency regulators and valves ..... DeZurik Corp.
Duotrol units (2), Model 57, for automatic control of jordan plug adjustment ..... Black-Clawson Co.
Hydrapulpers (3), 20 ft. dia., batch, 225 tons/day capacity, equipped with 96 in. dia. stainless clad rotors and No. 304 stainless extraction plates ..... Black-Clawson Co.
Instrumentation ..... Foxboro Co.
Jordans (14), Emerson 4-K, driven by 400 hp motors ..... John W. Bolton & Sons Inc.
Magnetic flow meters ..... Foxboro Co.
Pulp storage chests, tile construction, one 16-ton capacity and three 12-ton capacity chests ..... Stebbins Engineering Mfg. Co.
Selectifier screens (6), Model 24-P, totally enclosed pressurized, stainless steel construction ..... Black-Clawson Co.
Thickeners (3), 6 x 12 ft., 200 ton/day capacity ..... Champion Paper & Fibre Co.

Paper Machine

Air compressor ..... Ingersoll-Rand Co.
Air system, totally enclosed hood with special tight-closing features; Ross-Grewin system; high pressure calender cooling; trim conveying system using the new Ross Circlejector ..... J. O. Ross Engineering Co.
Blowers, turbo-compressors, multi-stage, centrifugal type, on felt turn rolls ..... The Spencer Turbine Co.
Calenders (2), 7 and 9 Farreloy rolls, equipped with nip-relieving systems and electrically operated roll lifts ..... Beloit Iron Works
Compressor, L-3 type, 150 cfm capacity ..... Nash Engineering Co.
Consistency regulators and valves ..... DeZurik Corp.
Dryers (80), 5 ft. dia., 125 psi pressure, 66 paper dryers, six Feeneys, and eight return felt dryers ..... Beloit Iron Works
Duopulpers (3), 12 ft., with 66-in. dia. rotors driven by 150 hp motors ..... The Black-Clawson Co.
Fourdrinier, removable, 246- in. wide wire, oscillating suction boxes and 42-in. dia. couch roll ..... Beloit Iron Works
Headbox, latest air pressure design, equipped with multiple-pipe dual-impingement distributor, five variable speed rectifier rolls and adjustable straight-lip slice ..... Beloit Iron Works
Helper and winder drives ..... General Electric Co.
Instrumentation ..... The Foxboro Co.
Paper machine drive, line shaft and differential drives with PIV speed control ..... Beloit Iron Works
Pits, wire-, couch-, and press-pits, tile construction ..... Stebbins Engineering Co.
P.I.V. units (12), five H-5 class and seven H-6 class ..... Link-Belt Co.
Press section, pick-up press, straight through, and smoothing press ..... Beloit Iron Works
Reel, constant speed, with 36-in. drum, air-loaded reel arms, and full width braking system ..... Beloit Iron Works
Reel crane ..... Euclid Crane & Hoist Co.
Rollgrinder, two-wheel, swing rest type ..... Farrel-Birmington Co.
Rollheader, equipped with pneumatically operated plattens, exhauster system, and air-operated roll ejector, designed to head rolls from 24 to 60-in. dia. ..... Valley Iron Works Co.
Size press, vertical, with 35-in. Microrok top roll and 36-in. rubber-covered bottom roll, equipped with automatic cut-off controls ..... Beloit Iron Works
Steam control and dryer drainage system, standard forced vapor circulation type ..... Ross-Midwest-Fulton Corp.
Steam turbine, prime mover of machine drive, 2400 hp multi-vane, multi-stage type ..... General Electric Co.
Tile chests and linings, couch and press pit, wire pit and well, flat box seal chests, vacuum pumps trench linings, white water chests, etc. ..... Stebbins Engineering & Mfg. Co.
Vacuum pumps (8), two K-8, one K-9, one L-3, and four 7208A. The 7208A's are driven in line by a single 1750 hp motor and have a capacity of 10,000 cfm ..... Nash Engineering Co.
Vickery felt conditioners ..... Bird Machine Co.
Winder, Model L, 6000 fpm double drum type, with oscillating unwind stand and individually driven sheet slitters ..... Beloit Iron Works

General

Air conditioning units ..... American Blower Co.
Building cranes ..... Whiting Corp.
Felts, synthetic reinforced cotton, Type 1166-S, equipped with Clipper Seams, 254-in. wide ..... Scapa Dryers Inc.
Filters, Auto-Klean, on starch sizing lines and small water lines ..... Cuno Engineering Corp.
Filters, Micro-Klean, instrument air filters .... Cuno Engineering Corp.
Light fixtures ..... Westinghouse Electric Co.
Motors ..... Allis Chalmers Mfg. Co.
Motors ..... Reliance Electric & Engineering Co.
Motor starters, including combination starters, circuit break type, Class 8538; two-speed motor starters, Class 8539; and four-speed motor starters, Class 8812 ..... Square D Co.
Pipe, hangers and pipe fittings ..... Grinnell Company Inc.
Pumps ..... Ingersoll-Rand Co.
Reinforcing steel ..... Truscon Steel Co.
Rotameters, Model 10A 1135M Purge Meters and Models 10A1712 and 10A1152 flowmeters ..... Fischer & Porter Co.
Stainless steel sheet, pipe and fittings ..... Armco Steel Corp., Carpenter Steel Corp., U. S. Steel Co.
Stainless steel plate ..... Crucible Steel Co.
Steel tanks ..... Chattanooga Boiler & Tank Co.
Stock valves, cast Wafer design of T-316 stainless steel, fabricated Wafer design, and fabricated T-316 stainless steel bonnetless ..... W. G. Rovang & Associates Inc.
Valves, corrosion-resistant gate, bronze gate, angle, needle globe, swing check valves, etc. ..... Wm. Powell Co.
Valves ..... Walworth Co.

ute cycle, are equipped with 96-in. dia. stainless-clad rotors and Type 304 stainless steel extraction plates. Each Hydrapulper is driven by a 350 hp. direct connected motor through standard No. 3 Hydrapulper drives.

From the Hydrapulpers, stock is pumped to three tile-lined storage chests. The storage chests are classed as a 16-ton capacity pine chest, a 12-ton capacity hardwood chest, and a 12-ton capacity broke storage chest.

Stock from the three storage chests is refined in ten 4-K jordans driven by 400 hp motors and then discharged to the 12-ton capacity tile-lined machine stock chest. Following this, it receives its final refining in three 4-K tickler jordans before entering the basis weight head tank. All jordans are equipped with two Model 57 Duatrol units which provide for automatic control of the jordan plug adjustments.

Following this, stock is pumped by a 20 LA type pump driven by a 1250 hp. motor to the Centri-Cleaner system which consists of 29 No. 623-4, 650 gpm capacity primary units, five No. 623, 500 gpm capacity secondary units, and two No. 623 tertiary units. The primary and secondary units are equipped with vacuum reject receivers.

A unique arrangement of the primary Centri-Cleaner system provides for the ability to shut off various combinations as required. Thus, five cleaners can be shut off at once on four different banks, or three cleaners can be shut off on two different banks — two on one bank, and one on the other bank.

The accepted stock from the Centri-Cleaners goes to six Model 24-P Selectifier Screens located immediately ahead of the machine headbox. The totally enclosed pressurized Selectifier Screens, made of No. 316 stainless steel, provide final screening and deflocculation of fiber bundles in the stock.

Piping throughout the stock preparation system is 316 stailness steel and stock flow is accurately controlled by magnetic fiow meters.

Paper machine

The headbox, of the latest air pressure design, is equipped with a multiple-pipe dual-impingement distributor, five variable speed rectifier rolls, and an adjustable straight-lip slice. Its level is automatically controlled by recirculation of stock to the primary Centri-Cleaner pump. Pressure in the headbox is provided by a L-3 type compressor which has a capacity of 150 cfm.

The removable fourdrinier has a 246-in. wide wire, a 36-in. dia. breast roll equipped with air motor lowering device, 27 table rolls of 13-in. dia. each, seven stainless steel suction boxes with provision for oscillating, a 30-in. dia. dandy roll, seven wire return rolls, two positive wire tension rolls with automatic wire tension control system, and a 42-in. dia. couch roll equipped with both high and low vacuum suction boxes.

The wire-, couch-, and press-pits are of tile construction. The wire pit is further designed to remove air and is equipped with foam removing skimming weirs.

The 27½-ft. high press section consists of an inclined three-roll suction pick-up press, a straight through suction press, and a smoothing press. The presses are equipped with suction boxes, felt conditioners, and necessary felt cleaning equipment. Conventional lubricating showers provide lubrication for the first three presses.

The dryer section, arranged in four parts, consists of 66 paper dryers, six Feeneys and eight return felt dryers. A size press, featuring a 35-in. Microrock top roll and a 36-in. dia. rubber covered bottom roll, is located between the third and fourth dryer sections. It is a vertical type press equipped with automatic cut-off controls.

All dryers are 5-ft. in diameter and designed to operate at 125 psi steam pressure.

Dryer steam control and condensate removal system is of the standard forced vapor circulation type with some modifications introduced by Champion's engineers.

There are two open-side calender stacks equipped with nip-relieving systems, electrically operated roll lifts, oscillating doctors, and air cooling systems. The first calender stack has seven and the second stack has nine Farreloy calender rolls including a 36-in. dia. king roll on each stack.

Following the two calender stacks, there are: (1) a heavy duty constant speed reel equipped with primary and secondary air-loaded reel arms, a 36-in. dia. drum, and a full width braking system; (2) a heavy-duty Model L double drum winder (designed for speeds up to 6000 fpm) equipped with oscillating unwind stand, individually driven sheet slitters, and automatic shaft removal systems; and (3) complete conveyors, transfers, roll wrapping and weighing systems. Each winder drum is driven by a 250 hp dc motor.

Wrapped rolls are headed in a roll header equipped with pneumatically operated plattens and air-operated roll ejector. Each platten features an exhauster system to hold pasted heads in place while heading. The roll header is designed to head rolls from 24 to 60 in. dia. and roll face of 22 to 80 in.

Three 12-ft. Duopulpers of stainless steel construction are located under the dry end to handle broke from the machine. One of the Duopulpers is located under the size press, one under the last dryer and first calender stack, and one under the reel to handle reel and winder trim. Each Duopulper is equipped with two 66-in. dia. rotors driven by two 150 hp motors through standard No. 1 Hydrapulper drives. The Duopulpers are further provided with automatic consistency control and agitator equipment.

Facilities for roll grinding are provided in the two-wheel, swing rest roll grinder designed for high accuracy and precision grinding.

Vacuum system

Vacuum in the wire suction boxes is provided by two (one K-8 and one K-9) vacuum pumps with capacities of 2290 cfm and 3150 cfm respectively at a vacuum of 10-in. Hg.

A K-8 vacuum pump with a capacity of 2210 cfm at 12-in. Hg. serves the felts, while an L-3 pump with a capacity of 145 cfm at 10-in. Hg. provides the vacuum for the dryer drainage system.

Four new 7208A pumps, driven in line by a single 1750 hp motor, provide the vacuum for the couch, presses, pick-up and wringer roll. These four pumps have a total capacity of 10,000 cfm. An interesting feature of the new 7208A pump is its four-inlet arrangement which permits taking from a single pump a variety of vacuums and capacities so that, by combining the inlets of the four pumps, it is easy to secure the exact vacuums and capacities required by the various sections of the machine.

Paper machine drive

The prime mover of the machine is a 2400 hp multi-vane, multi-stage, non-condensing 400 psi steam turbine, with a ten-to-one speed range. The turbine drives the machine through a line shaft and differential drives. Each differential drive is equipped with P.I.V. speed control and air-operated clutch connection between the differential and the transfer gear cases on the indrives at the wire turn roll, first and third press rolls, smoothing press, four dryer sections, size press, calenders and reel. Five of the 12 P.I.V. units are of the H-5 class and seven of the H-6 class.

Electric helper drives are located at the couch, wire return roll, second press wringer roll, pick-up roll, felt turning suction rolls, top size press roll and various tension rolls.

Air system

The machine room air system includes a totally enclosed hood, of the latest design and made of aluminum insulated and corrugated panel sections. It has special tight-closing features and is equipped with an automatically controlled exhaust system to maintain constant ambient conditions inside the enclosure. Machine room ventilation includes wet end and dry end roof heating and ventilating, roof exhaust, rear machine aisle and mezzanine ventilation.

The air system further includes a Ross-Grewin system which has multiple control features for complete flexibility of operation. The high velocity felt drying system is equipped with volume and distribution controls to meet variable drying requirements.

The high pressure calender cooling system—applied to both calenders—features a high capacity, refrigeration system supplied by a 40-ton compressor-condenser unit.

The trim conveying system utilizes the new Circlejector and is equipped with a special automatic volume control for varying volume with winder speed to prevent snap-off during acceleration of the continuous ribbons of trim which it conveys.

The use of pipe, fittings, pumps and valves in the pulp and paper industry

ROLAND L. ALLEN JR.
Vice President, Eastern Engineering Co.

Part IX — Application of pipe, fittings, pumps, and valves in pulp washing and screening

FOR WASHING and screening neutral sulfite semi-chemical or kraft pulp, the piping, instrumentation and equipment required by both processes are almost identical, except for materials of construction. The kraft pulp, being alkaline, utilizes cast iron and steel materials and equipment with stainless steel trim. The neutral sulfite semi-chemical pulp, however, requires the use of stainless steel materials.

Both processes require the following systems:

A. Unwashed stock.
B. Filtrate.
C. Washed stock.
D. White water.
E. Hot water.

The kraft process requires the following additional systems:

F. Black liquor foam.
G. Soap.

The flow sheet has the systems marked with letters to correspond with the above list.

Unwashed stock system

The unwashed stock, marked A on the flow sheet, is pumped from the blow tank to the washing system. In the case of kraft pulp, the unwashed stock may be pumped to knotters ahead of the washer line where knots are removed as shown on the flow sheet, or it may be pumped through knot brakers or refiners where the knots are fibrated and the knotters thereby eliminated. In either case, the piping, valves and pumps are identical. The piping is ASTM A-53 or A-120 carbon steel. The valves are cast iron or 3 per cent nickel cast iron pulp stock valves with stainless steel trim. Fittings may be either weld end steel or 125-lb. class cast iron flanged fittings. Pumps are cast iron or nickel cast iron with stainless steel trim and of the open impeller end-suction design. Pumps with variable speed drives are quite common for this service.

In the case of neutral sulfite semi-chemical pulp, the pulp has not been fibrated in the digesters and must be refined before washing can be accomplished. The pulp is pumped from the blow tank to a drainer where liquor is separated and the softened chips conveyed to the refiners. After refining, the pulp is diluted with washer filtrate and pumped to the washers.

All piping should be type 316 stainless steel. Valves may be 3 per cent nickel cast iron pulp stock valves with stainless steel trim or all stainless steel. Pumps should be 3 per cent nickel cast iron with stainless steel impellers of the open type.

Filtrate system

The flow sheet shows a three-stage line of washers. Washers may be arranged in one or more stages, depending upon the degree of washing desired. Also, washers are obtainable with two stages of washing on a single washer. Frequently, single and two-stage washers are arranged in the same line.

The three-stage line shown is typical, and the use of two-stage washers does not alter the basic principles. Washer filtrate is marked B on the flow sheet.

Pulp washing is counter-current in nature. That is, where the unwashed stock is supplied to the first washer in the line, wash water is supplied to the showers on the last washer in the line and the filtrate from this last washer is supplied to the showers on next to the last washer in the line and so on until the filtrate from the second washer in the line is supplied to the first washer in the line. Therefore, pulp flow and filtrate flow are countercurrent to each other. As the filtrate progresses from the last washer to the first, it progressively increases in concentration and as the pulp progresses from the first washer to the last, it progressively becomes freer of dissolved organic and inorganic matter.

Although the filtrate from the various stages is of different concentration, it is handled with identical piping materials and pumps.

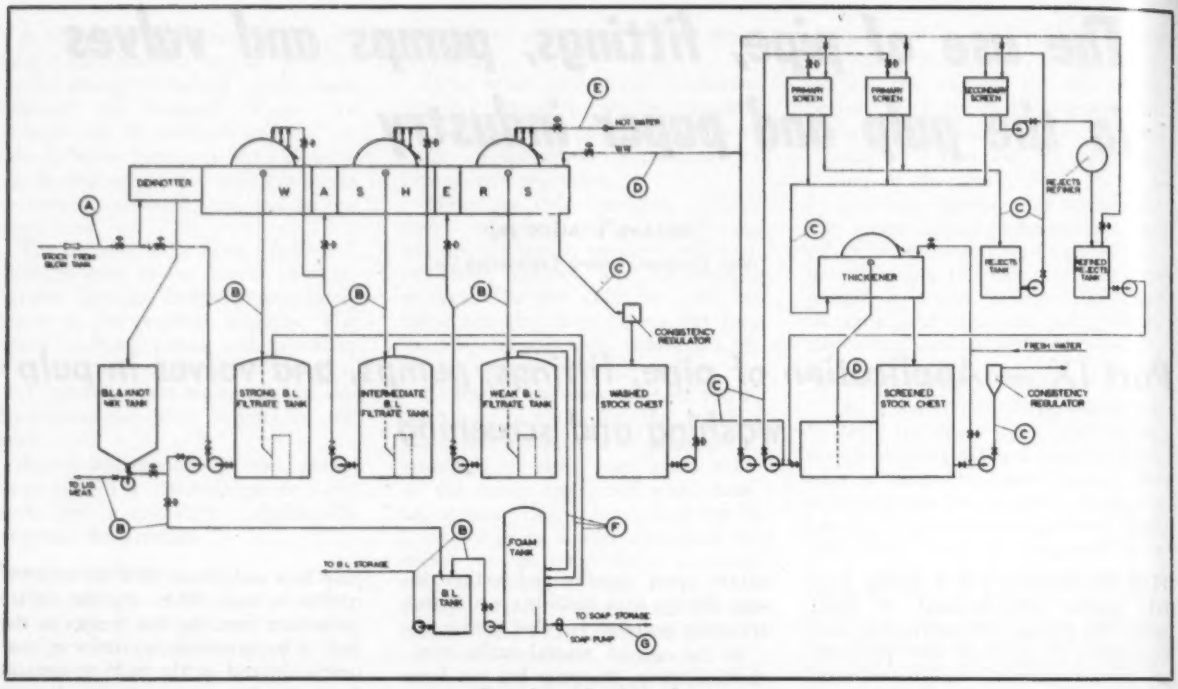
The kraft filtrate or black liquor is handled in ASTM A53 or A120 carbon steel pipe and carbon steel weld end or 125-lb. cast iron flanged fittings. The valves are 125-lb. cast iron stainless steel trim. Pumps should be cast iron stainless steel trim of the double suction type. For most pump designs, the impeller wear surfaces or the casing wear ring should be modified to prohibit binding from the small amount of fiber present in the filtrate.

The neutral sulfite semi-chemical filtrate or brown liquor is handled in type 316 stainless steel pipe and fittings. This pipe, as well as any other stainless steel piping in the washing and screening systems should be of thin wall construction. The wall thickness should be as follows:

3″, 3½″ and 4″	- 0.083″
5″, 6″, 8″, 10″ and 12″	- 0.109″
14″, 16″ and 18″	- 0.125″
20″ and 24″	- 0.140″

Valves should be 3 per cent nickel cast iron with stainless steel trim or all stainless steel.

Pumps should be 3 per cent nickel cast iron with stainless steel trim of the double suction type. The statement made concerning the treatment of impeller wearing surfaces for black liquor service also applies for brown liquor.



Flow sheet of pulp washing

All valves in filtrate service should be of the wedge gate and swing check types. Check valves should be installed in the washer dilution lines so that pulp cannot enter the filtrate tanks during start-up or shut-down or in case of pump failure.

Note that the knots from the deknotter are shown being returned to the digesters with the digester charging liquor. This is one of several ways that knots are handled. It is not a completely satisfactory way of handling knots, but all other methods of knot handling also have disadvantages. Much of the trouble of handling knots in the manner shown may be eliminated by refining the knots before the return to the digesters. This, of course, requires additional capital expense as well as additional operating and maintenance expense.

Piping for knot service should be the same as for filtrate. Valves should be the same as for unwashed stock. Pumps should be of the trash type with open impeller and no-close running clearances.

Washed stock system

Washed stock piping is marked C on the flow sheet. The materials of construction for this system may be carbon steel, stainless steel, asbestos cement, galvanized steel, copper or wood-lined steel. The choice of materials is dependent upon such factors as washing efficiency, local water conditions and the end use of the pulp.

Washed kraft pulp is generally handled in carbon steel piping, while washed neutral sulfite semi-chemical pulp is frequently handled in carbon steel piping, but more generally with stainless steel. Where neutral sulfite semi-chemical pulp is not to be bleached, it is frequently not thoroughly washed and, therefore, corrosive to carbon steel.

In general, well washed kraft or neutral sulfite semi-chemical pulps may be divided into two classes according to the degree that the pulp must be protected from contamination. Where a small amount of contamination from mill scale and rust is not objectionable, carbon steel piping may be used. Where any contamination from mill scale and rust is objectionable, one of the other listed materials must be used.

Bleachable grades of pulp fall in the last category, and it is general practice to install stainless steel piping or one of the other corrosion-resistant piping materials in pulp service from the final washer through the screens. Occasionally, carbon steel piping is used from the final washer to the screen supply, with stainless steel piping for the screened pulp.

Galvanized steel or copper piping should not be used unless the pulp is well washed. Asbestos cement piping should not be used on neutral sulfite semi-chemical unless the pulp is well washed.

Pulp stock valves may be fabricated stainless steel or cast iron with bronze or stainless steel trim for well washed pulp service on both kraft and neutral sulfite semi-chemical. If kraft pulp is not well washed, bronze trim valves should not be used.

Pumps for washed pulp service should be cast iron with bronze or stainless steel trim of the end suction, open impeller type. As in the case of the valves, bronze trim pumps should not be used for kraft pulp unless the pulp is well washed.

White water system

The white water system is marked D on the flow sheet. The materials of construction for this system should be the same as those for the washed pulp system, except that valves should be the wedge-gate style and pumps should be of double-suction type. End suction pumps may be used, but the double-suction pumps is usually the most economical.

Hot water system

Hot water is normally used for washing pulp. This piping is marked E on the flow sheet. As has been mentioned previously, hot water piping material selection is governed by the characteristics of the local water and the permissible amount of contamination. Carbon steel, galvanized steel, copper, stainless steel and even wood-lined steel piping have been used with success. Copper or galvanized piping should not be used where the water is alkaline. Valves should be bronze or

(Contd. on page 314)

Adhesives in the paper industry

Part VI — Inorganic adhesives

Among the inorganic adhesives, sodium silicate is the only one of importance to the packaging industry. Its largest field of application is in corrugated board production.

A VARIETY of inorganic adhesives are known. Since these tend to be inexpensive materials, they enjoy wide usage. Only one of these, however, sodium silicate, is of importance in the packaging industry. Among the other inorganic adhesives, as reference to Table III (see Part III) will indicate, are Portland cement, magnesium oxychloride or oxysulfate, plaster of Paris, and litharge-glycerol combinations.

Sodium silicate

The use of sodium silicate as an adhesive was first suggested by von Fuchs around 1825. However, commercialization of the idea did not actually begin until the early part of the 20th century when silicate was adopted as the standard adhesive in the then new corrugated box industry. The advantages of a cheap, quick-setting mineral adhesive were quickly recognized. Silicate came to be used not only in the production of various paper boards, but in the fabrication of paper drums, cans, and tubes, and in numerous sealing and labeling operations.

Literature on the subject of sodium silicate as an adhesive is extensive. Vail (12) and DeBruyne and Houwink (4) discuss the subject thoroughly. Wills and Sams (13) have presented a detailed discussion of the colloidal properties of sodium silicate and its application in industrial adhesives. Reviews of the use of silicate adhesives specifically in the paper industry are available. (14, 15)

Chemically, sodium silicate may be considered as a combination of sodium oxide (Na_2O), silicon dioxide (SiO_2), and water. Within a wide range the ratio of sodium oxide to silicon dioxide and the concentration may be varied in a continuous manner with corresponding changes in chemical and physical properties. This explains why it is possible to formulate silicate solutions which will meet almost any adhesive requirement. For adhesive application, however, the $Na_2O:SiO_2$ ratio is usually between 1:2 and 1:4.

Sodium silicate is manufactured by fusing a mixture of sodium carbonate and sand in open hearth type furnaces at temperatures of 2400°-2700°F. The resulting fusion product upon dissolving in water gives a practically clear, viscous solution at high concentration. The adhesive is generally sold as water solutions with closely controlled concentrations to give viscosities suitable for the intended applications. Delivered in this form, it is ready to use without further processing. Silicate glass may also be obtained in briquette or crushed form. In this case the glass is dissolved in pressure dissolvers to produce the adhesive.

Properties of sodium silicate

In order to understand the adhesive character of sodium silicate, it is necessary to have at least a general understanding of its colloidal, rheological and physical properties.

Usually adhesives are colloidal in nature which tends to render them viscous. The colloidal nature of sodium silicates varies widely with the silica to soda ratio and concentration. The proportion of colloidal particles or silica micelles increases continuously with increasing ratio. The number and size of the colloidal micelles increase sharply at about 3 ratio. This accounts for the ratio of 1:3.2 to 1:3.3 at gravities of 40° to 42.5° Bé as constituting the preferred adhesive range for corrugated container production.

Other properties which also change with ratio include viscosity, gravity, alkalinity, wetting power and film strength.

Viscosity is especially important in adhesive work and, accordingly, plays a large part in determining the grade of silicate for adhesive use. Wetting power and, in the case of paper, penetration, are vital to good adhesion. Wetting and penetrating power are dependent on both viscosity and ratio. The more alkaline ratios wet the substrate more rapidly than the highly siliceous ones at corresponding viscosities. On the other hand, an increase in viscosity of a given ratio will decrease wettability, and vice versa. Viscosity of a given silicate may be lowered by addition of a small amount of water or by raising the temperature. This is generally desirable when adhering heavily calendered or heavily sized sheets.

Efforts have been made to use more viscous silicates through addition of wetting agents as a means of lowering surface tension and increasing the wetting power. However, this practice has not become widespread due to the high wettability of the silicates as such.

Silicate adhesives in corrugated board

Production of corrugated board constitutes the largest application of silicate adhesives in the paper industry. Setting time is a vital factor in this operation as it determines machine speed and, therefore, production rate. Silicate sets quickly through the loss of a small amount of water. This water loss occurs both by evaporation and by absorption into the paper. There must be a slight penetration of total adhesive in order to form the

good mechanical and chemical bond which is characteristic of silicate.

When a certain concentration is reached an extremely rapid increase in viscosity occurs, whereupon the silicate passes through a tough plastic mass and finally into a hard, firm solid. Initial set occurs by loss of water to about 40,000 poises. The amount of water loss required to reach this state is dependent on concentration and ratio. A 42.2° Bé silicate at a viscosity of 400 centipoises and 61.3 per cent water will set when only about 15 per cent of the water has been removed.

The hard, firm silicate bond is many times stronger than the paper which it combines and stiffens the substrate to which it is applied. This is advantageous in corrugated boxes as it serves to increase compression strength. It has been shown that silicate combined boxes average some 10 per cent higher strength than boxes combined with other common adhesives (16).

Unlike the organic adhesives, sodium silicate is not attacked by molds, fungi, or vermin. Also it is non-combustible.

Dried silicate residues are brittle when anhydrous. However, resiliency of bond increases with small amounts of water, and under proper combining conditions a relatively high per cent of residual water remains. At low humidities resiliency may be improved by incorporation of such materials as rubber latex, sugars, glycerol, etc.

For corrugated board manufacture clay may be added to the silicate. This is generally done to body up silicate which has been diluted in order to obtain better wetting. The clay serves to control penetration and set. It imparts thixotropy to the mixture whereby the gel structure tends to form earlier than with straight silicate. This makes for higher speed operation, and is said to produce a smoother, harder board with less warp and higher flat crush and compression strength. The amount of clay added to a 3.3 ratio silicate ordinarily varies from seven to fifteen per cent, along with five to ten per cent water.

Sodium silicate is readily compatible with other adhesives such as starch. Thus, starch-silicate adhesives have come into use in the corrugated field. In a particular formulation equal quantities of starch and silicate are used. The adhesive is formulated by combining the starch with water and adding this mixture to the silicate. Such adhesives have tack when wet due to the presence of the starch. Dextrin provides even more tack but tends to lower tensile strength.

Not only does sodium silicate form strong bonds with paper but with metal surfaces as well. Accumulations on hot corrugator plates and rolls require time for removal. This has been a source of complaint in continuous corrugator operation. Various methods have been devised for reducing the adhesion of silicate to metal. The surfaces may be coated with graphite, bakelite varnish, paraffin, or other anti-adhesive materials. Also addition of certain agents to the silicate have been found helpful. These include various resins, rosins, wetting agents (17) and urea (18). A recent development based on a composition of silicate, urea, and clay goes a long way toward eliminating metal adhesion (19).

The sodium silicates are alkaline, and under adverse conditions there is a tendency for the alkali to migrate through the paper and cause staining. This condition is accentuated by allowing excessive penetration to occur during bond formation. Excess penetration can result from applying too much adhesive, or by using one that is too alkaline or too low in viscosity. However, under modern practice these factors are properly controlled so that alkali staining is negligible for ordinary uses of paper board containers. Various methods for prevention of alkali migration under high humidity conditions, such as treating the sheet with aluminum salts, have been suggested (12).

Since sodium silicate is water soluble, the straight silicate bond is not water-proof. Even so, redissolution of the dried film is slow, and compared to other water soluble adhesives sodium silicate bonds are quite resistant. Water resistance can be improved by modifying the silicate solution with clays, resins, latices, and proteinaceous materials.

Other uses of silicate adhesives

Silicate adhesives are used in the sealing of paper box flaps. This operation may be performed either by hand or by machine. For hand sealing a tacky, high viscosity silicate such as a 2.9 ratio at 47° Bé is generally recommended. If faster set is desired, one should use a higher ratio such as 3.22 at 42.5° Bé. For machine sealing lower viscosities are used due to the higher pressures available in the operation. Here, either of the two above silicates, but slightly diluted, may be used. Again the choice will depend on the speed of set required.

The manufacture of fiber cans, tubes, and drums are other examples of laminations where the silicate adhesives perform well. Fast setting, high viscosity silicates are used in these winding operations, an example being the 3.22 ratio at full strength. The adhesive may be formulated with clay or calcium carbonate to control body, tack, and setting rate.

Sodium silicates may also be used as the adhesive for laminating paper to form various types of wall board, insulating board and sound absorbing wall coverings. Again clay, calcium carbonate, and other fillers may be incorporated into the adhesive. One recommended formulation makes use of a silicate with sodium oxide to silicon dioxide ratio of 1:2 combined with equal parts of water. Fifty parts of this mixture are then combined with 60 parts of calcium carbonate to produce the adhesive.

The pasting of paper labels on containers is still another application for the sodium silicates. For this purpose the less alkaline silicates with ratios around 1:4 are usually preferred. Here the adhesive may be used as an overcoat varnish on the label to preserve it.

Among other regular uses for silicates in the paper industry may be mentioned the application of ungummed tapes, the manufacture of sandpaper where silicate may be used as the binder for the abrasive granules, and for laminating aluminum foil to various paper substrates.

In this discussion we have made reference to various materials which may be combined with sodium silicates. Many others have been suggested in order to obtain a variety of properties for specific applications. Braude (1) provides many formulations for silicate based adhesives containing such materials as gelatin, soybean meal, wood flour, chinawood oil, and copper sulfate. Rosin, blood albumin, calcium fluoride, asphalt, ammonium fluoride, litopone, zinc oxide, and zinc carbonate are among other ingredients formulated with sodium silicate to provide adhesives for specific purposes.

DeBruyne and Houwink (4) describe in detail numerous other combinations of sodium silicate with calcium carbonate, starch, proteins, rubber latex and a variety of miscellaneous substances including organic resins and inorganic compounds and fillers. Additional details on formulated silicates are presented by Vail (12) while Delmonte (3) has added to the subject at some length.

Although by no means exhaustive, this discussion on silicate adhesives should offer a clear idea of the many ramifications and wide usage of those adhesives in the paper industry. The other inorganic adhesives listed in Table III (see Part III) will not be discussed in detail in this review since they find very little, if any, application in this particular field.

Multiwall bag manufacture at St. Regis Paper Company

Part III

WALTER J. MACEY
Director of Adhesives
St. Regis Paper Co.
and
EDWARD H. HILL
Technical Representative of the Paper Industry
Corn Products Sales Co.

Steps in the preparation of seam and bottom pastes; properties and tests of finished pastes.

IN THE PREPARATION of seam paste, the operator first runs water at about 65°F. into the 325-gal. horizontal cooker until the water comes within 21 in. of the top, a total of about 142 gal.

After turning on the ribbon agitator, which rotates at 25 to 30 rpm., he adds 1 lb. of stabilizer and 3 lb. of neutral soap as flakes. The neutral soap gives a smoother paste, helps to minimize any tendency toward gelatinization, and acts as a lubricant for the adhesive when it is being pumped. Since the neutral soap affects viscosity, increasing the soap content will thin out the adhesive somewhat.

Next, the operator adds 100 lb. of fine particle clay. The clay helps to hold the adhesive on the paper surface, especially in porous or slack-sized paper.

Then he gradually adds the No. 7211 starch, a bag at a time, with agitation, until a total of 700 lb. has been introduced. Ten per cent of the urea-formaldehyde resin, based on the starch solids, is added next. St. Regis uses dry powdered urea resin.

Heating the batch to 195°F. by direct steam takes about 1 hr. Three pounds of defoamer is added when cooking temperature is reached, and the batch cooked for 10 min. at 195°F. The pH is adjusted after cooking, if necessary, usually by adding 0.75 lb. of alum. A finished batch comes to within 4 in. of the top of the cooker, and contains about 201.3 gal. of water, with steam condensate furnishing 44.3 gal. of this total.

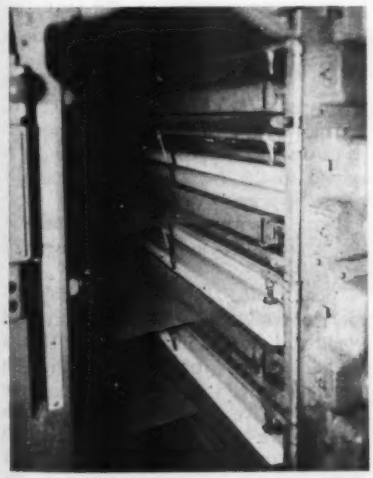
The batch is dropped or discharged into one of the storage tanks at not less than 120°F. or warmer. In the storage tank, with its thermostatically controlled cooling coils, the batch is cooled to 90°F. It can then be pumped into the other storage tank or directly to the machine. A finished batch of seam paste weighs 2,561 lb.

Preparation of bottom paste

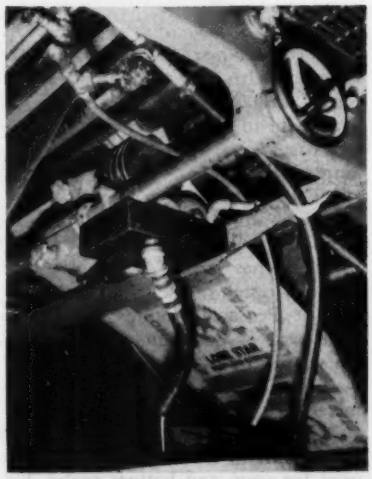
Bottom paste is similarly prepared. The operator runs about 142 gal. of water into the 325-gal. cooker, bringing the water level to within 21 in. of the top. With the agitator running, he then adds wetting agent and neutral soap flakes. The wetting agent gives the finished adhesive a better bite into the paper. In the preparation of the batch, moreover, it has other functions, acting as a detergent and also helping to get the starch saturated. That is the reason why it is added first. The neutral soap has the same thinning and lubricating function that it does in seam paste.

Next, the operator introduces the No. 5063 starch, a thin boiling starch. The starch is added a bag at a time, with continuous agitation, until the contents of seven bags or 700 lb. of starch have been dumped into the cooker. Then the powdered urea resin is added. For bottom paste, St. Regis uses 8 per cent of urea-formaldehyde resin based on the dry starch.

The batch is heated by direct steam to 190°F. and cooked for 30 to 45 min. at that temperature. A preservative is added after cooking, and if



View of cross paster on the universal tuber.



Seam paste pot and wheels on universal tuber.

necessary the pH is adjusted, usually with alum but sometimes with soda ash, to 6.5 to 7.0. The paste must be slightly acidic, with a pH below 7, for the resin to cure and develop water resistance.

A finished batch of bottom paste comes to within 4 in. of the top of the cooker. It contains about 207 gal. of water, of which 44.3 gal. is steam condensate.

Since it is thicker or more viscous than seam paste, the bottom paste is dropped at 140°F. to facilitate its discharge from the cooker. At that temperature, it flows readily. Cooling the bottom paste takes longer than cooling seam paste. A finished batch of bottom paste weighs 2,443 lb.

Properties of finished pastes and tests

In preparing seam paste or bottom paste, it is of utmost importance that the operator add precisely the correct amount of each constituent to the batch. To insure the requisite characteristics in each type of paste, the solids content, specific gravity, pH and viscosity of every finished batch are carefully determined in plant control tests.

Finished seam paste has a higher solids content than bottom paste, 26 per cent compared with 23 per cent. Specific gravity of seam paste is 1.09 and of bottom paste 1.08.

The pH of these adhesives is extremely critical. The paste must be acidic enough for curing to take place and water resistance to develop. However, it cannot be too acidic since that would shorten pot life. The pH of bottom paste ranges from 6.5 to 7.0. Seam paste has a pH between 6.0 and 6.5. Its liquid working life is at least three days. It takes five to seven days for it to cure or polymerize, becoming water-resistant.

Viscosity is determined by the GE Zahn cup method. At 90°F., finished seam paste has a No. 4 Zahn cup viscosity, averaging 35 sec., which is equivalent to 1,200 to 1,300 cps. Bottom paste has a much higher viscosity, ranging from 70,000 to 90,000 cps. at 80°F.

Just as are the samples from all St. Regis bag plants, control samples of paste batches made at Franklin are carefully tested in the adhesive laboratory at Pensacola. Solids content of each paste is determined by refractometer, pH by a Beckman meter, and viscosity with a Brookfield viscosimeter.

Water-resistance tests, of course, are all important. Different methods are used for seam and bottom pastes, but both employ water immersion.

Seams pasted with water-resistant adhesive are tested by fastening a 100-g. weight to one end of a 1-in. wide strip with pasted seam, then hanging the strip in water at 70°F. and timing how long it takes for the pasted seam to come apart and the weighted end to fall.

The 1-in. wide strips for this test are cut from sample bags across the pasted seam so there is 4 in. on each side of the seam. The strips are conditioned before water immersion by letting them dry normally under weight and then putting them in an oven for 2 hr. at 200°F. This conditioning accelerates cure, and is equivalent to the 5- to 7-day aging usually required for adhesives made with starch and resin to develop maximum water resistance.

In testing bottom paste, samples cut from the pasted bottoms of newly manufactured bags are first dried normally under weight for 8 hr. and then placed in an oven for 2 hr. at 200°F. Each sample is then soaked in water at 75°F. until fibers no longer tear. To meet water resistance requirements of St. Regis, the pasted seam should still pull fiber after at least 24 hr. of immersion. For satisfactory water resistance, St. Regis looks for up to 60 or 70 per cent fiber tear.

Crystallization tests are made on 1-in. wide strips cut from the sample bag across the pasted seam. One of these strips is examined after drying in an oven for 24 hr. at 210°F., and another after drying over anhydrous calcium chloride in a desiccator for six days. The paste seam in each strip should show no evidence of crystallization or loss in adhesiveness.

Whenever a new shipment of starch or dextrin arrives at Franklin a trial cook is made as soon as possible, and the paste is used on the machine for a test run the following day. Sample bags are taken with the machine running at full speed, and these bags are tested the day after they are made. The test bags, together with a 1 qt. sample of the paste, are then shipped immediately to the laboratory at Pensacola.

Binding time, water-resistance and crystallization tests on adhesives are made daily for every tuber in operation at the Franklin plant. Test results are reported weekly to the Pensacola laboratory.

During manufacture, at least every hundredth tube coming off each tuber is inspected for seam and cross paste application. The tubes are opened, and the seam paste line and cross pasting examined. Every wall should have a continuous line of paste with the proper quantity and tape applied in the proper place. The tuber inspector likewise watches for any evidence that the paste may have been killed.

Pipe, fittings, pumps etc. in pulp washing

(Contd from page 310)

cast iron with bronze trim for most systems. Occasionally, it may be found necessary to use cast iron valves with stainless steel trim. Pumps should be cast iron with the same trim as the valves. When pumping hot water, the pump selected should have a low required net positive suction head and the piping system should be arranged to provide a high available net positive suction head.

Foam system

The lines marked F on the flow sheet are foam lines from the black liquor filtrate tanks to the foam towers. These lines are required for kraft washer systems to dispose of the foam produced in the washer and washer drop leg. The piping should be carbon steel and may be of thin wall construction. The lines are usually rather large, ranging in size from 12 to 24-in. in diameter. A considerable savings can be realized by using spiral-welded carbon steel or other light-weight carbon steel pipe. There is virtually no pressure in the system. Therefore, these lines are really little more than ducts.

Valves are seldom used or necessary in this service and pumps are not required. Where it is found advantageous to use a valve, consideration should be given to the use of flange blanks. If this is not feasible, cast iron valves with stainless steel trim may be used.

Soap system

When the foam is broken down, soap floats to the top and black liquor settles to the bottom. The soap line is marked G on the flow sheet.

On some pine kraft systems, it is also necessary to skim soap from the surface of the strong black liquor filtrate in the filtrate tank. This soap is piped to the foam tower and usually flows by gravity.

Soap is either converted to tall oil or sold in its crude form to users of tall oil.

Soap piping should be ASTM A-120 or A53 carbon steel with carbon steel weld-end or cast iron fittings. Valves should be all iron or cast iron with stainless steel trim. Pumps should be of a positive displacement type such as gear or rotary and should be all iron or cast iron with stainless steel trim.

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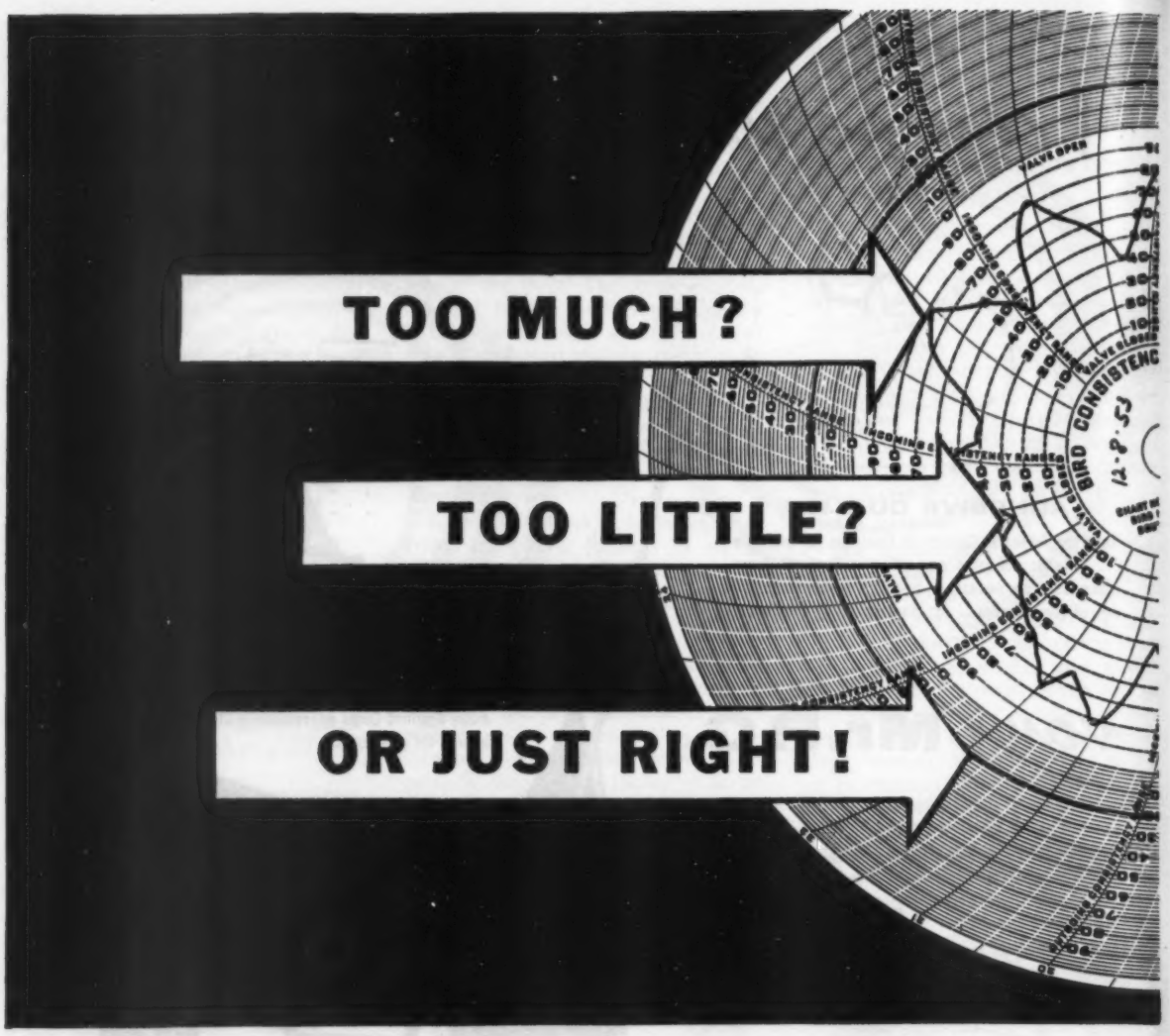

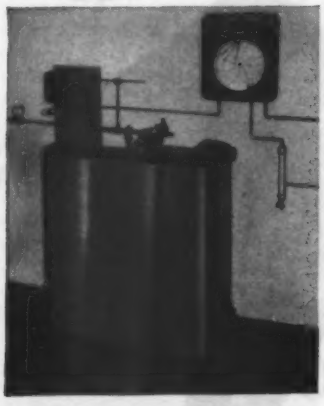

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CURRENT COMMENTS

U.S. — an industrial island? . . . Tariff League to change name and policy

By WARREN B. BULLOCK

The United States, industrial colossus of the world, is on the way to becoming an industrial island isolated by groups of nations forming customs unions, each intent on pursuing its own interests.

This country, which fostered and developed the reciprocal trade agreement program under which the world was expected to follow a joint program of reduction of tariff barriers, now finds other nations rapidly grouping into blocks which might well become self-serving cliques, each with its own economy to conserve, regardless of the effect on its neighbors.

The manner and speed with which the European Economic Community is progressing into an active trade group has led Great Britian, Sweden, Denmark, Norway, Switzerland, Austria and Portugal to take preliminary steps toward another but similar customs union.

The United Nations, through the U.N. Economic Commission for Latin America, has urged all Latin American nations to give serious consideration to the coordination of national industrial activities with a view toward eventual participation in a third common market organization.

The group, of which Britain is a potential member, will have immense international power inasmuch as the British colonies will participate through the empire preference policy, including Canada to the north of us. Britain, therefore, will be able to compete on more than even terms with the producers from other areas.

With the United States thus standing alone in a sea of competition, these world wide developments have both hopeful and disturbing possibilities for United States industry. The Western European market is the richest field for exploitation by United States exporters since it involves some four billions of dollars a year in exports. Only time can tell whether these developments will result in universal economic cooperation with greater prosperity for all, or whether the huge foreign market will split into rival trading blocs.

The problem is one of vital importance to the United States paper industry. Not less than $100,000,000 a year in exports of pulp, paper and paper products is involved and the paper making nations of Europe are not blind to the opportunities and dangers in the common market program. Representatives of the paper industries in West Germany, France, Belgium, the Netherlands and Italy have met in Frankfurt to set up a joint committee to look after the interests of the paper industry within the common market area and other European markets as well.

Changes in the Tariff League

Symptomatic of the change in the atmosphere for international trade is the action of the 74-year-old American Tariff League in abandoning its historic battle for protective tariffs and to change its name to the Trade Relations Council of the United States. The new policy will be to "encourage an international atmosphere emphasizing freedom to trade rather than free trade." Studies to be initiated will cover such key issues as foreign-domestic wage rates, as well as United States foreign investment and its effect on United States industry.

$11,000,000 mill in Tunsia

The building of paper mills in far flung regions continues. The latest announcement is that an esparto mill to make book and similar papers from esparto grass is planned for Tunsia, the center of the esparto producing area of Africa. A private United States concern is said to have been awarded the contract to build an $11,000,000 mill with an esparto pulp capacity of 80 tons per day for the Societe National Tunisienne de Cellulosa, a Parisian corporation. The Tunisian Government will finance half of the cost, with European and United States capital furnishing the balance. The Development Loan Fund of Washington is providing a $6,500,000 credit for the promoters.

New mergers

Two giant paper mills of the Pacific Northwest are to be merged, Powell River Company and MacMillan & Bloedel Ltd. having completed plans to become one corporation to be known as MacMillan, Bloedel & Powell River Ltd. Under the proposed merger, Powell River will split its outstanding common shares two for one and give seven of the new shares for each three shares held by MacMillan & Bloedel shareholders. Powell River is best known for its newsprint output with nine paper machines up to 248 in. in width. The new corporation will have the huge timber resources of the old MacMillan & Bloedel holdings. Among projected expansions is a flake board mill already under construction. The MacMillan & Bloedel corporation has listed assets of over $175,000,000, and while the announcements do not give Powell River's capital value it is known to be one of Canada's greatest corporations.

Other mergers are under way on the United States side of the border. United States Printing & Lithographing Company and Diamond Gardner Corporation are to be merged if stockholders of the two corporations approve. Diamond Match, which became Diamond-Gardner when acquiring the Gardner paperboard interests, is now to have a new name, not yet announced. The new corporation will combine annual sales totaling approximately a quarter of a billion dollars, and the assets of the two corporations are listed at over $155,000,000 by records of the New York and Cincinnati stock exchanges.

St. Regis has registered a new stock issue of 20,000 shares of common

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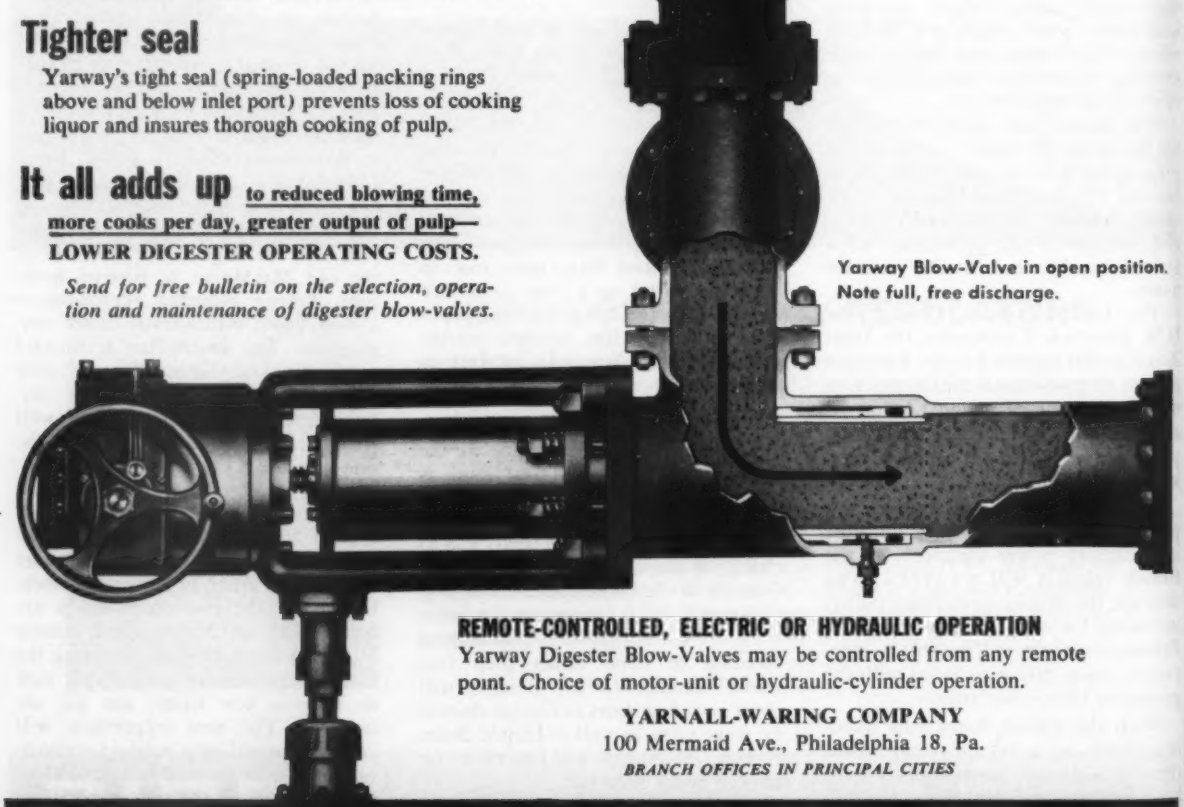

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stock to be exchanged for 110,000 shares of Chemical Packaging Corp. of Savannah, Ga. The projected merger will give St. Regis better facilities for serving its multi-wall bag customers in the southeastern states. St. Regis is registering another issue of stock for the acquisition of 44,225 outstanding shares of stock of the Lone Star Bag & Bagging Co. of Houston, Texas.

Financial Report

While paper mill securities in the main rose during the month in harmony with the rest of the securities markets and the improved atmosphere in the paper markets, quotations for paperboard issues were less active, possibly on the basis that production has temporarily at least stopped its upward climb.

Stock and Bond Quotations

New York Stock Exchange — Stocks

Closing Prices	July 10, 1959	June 10, 1959
American Can	46	42⅜
Same Pref.	37⅝	36⅝
Celotex	39⅝	38½
Same Pref.	* 18½-19½	* 19¼-19¾
Certain-Teed	14⅛	14⅜
Champion P & F	* 41-41⅛	40½
Same Pref.	94	* 90½-91½
Chesapeake of Va.	* 38¼-39	42¼
Container	26¼	26½
Same Pref.	* 90-91	* 90-92
Continental Can	47½	45⅝
Same Pref.	79½	81
Crown Zellerbach	53¼	50¾
Same Pref.	91¾	91½
Diamond-Gardner	33⅜	31¼
Same Pref.	30¼	30
Federal Paperboard	45¾	46¼
Same Pref.	22⅛	21¾
Fibre Paper Board	51⅜	51¼
Great Northern	50	50
Hammermill	31⅝	28½
International	122⅛	118¼
Same Pref.	90½	* 90½-92¼
Kimberly-Clark	69¼	65⅛
McAndrews & Forbes	33	* 30¼-31
Masonite	42½	43¼
Mead Corp.	46½	42¾
Same Pref.	* 90-92½	* 90-93
Minnesota & Ontario	35¾	34¼
Oxford Paper	31½	34¼
Same Pref.	* 93-94	95½
Rayonier	39½	24⅛
Riegel Paper	38½	34½
St. Regis	52	47⅝
Same Pref.	* 93⅛-95	96
Scott Paper	83	77¾
Same $4 Pref.	* 87-89½	
Same $3.40 Pref.	* 77⅛-78⅛	* 77½-79
Sealright	41⅜	33¾
Standard Packaging	36½	31⅛
Same $1.60 Pref.	—	* 90-98
Same $1.20 Pref.	40½	31½
Sutherland Paper	39	41
Union Bag-Camp	45¾	47
United B & C	35½	32
United Wallpaper	8¼	* 8⅜-9
Same Pref.	* 18-19⅛	* 18-19½
U. S. Gypsum	108	107¾
Same Pref.	*156⅛-152	151¾
West Va. P & P	48	44¼
Same Pref.	* 97-98	96¼

New York Stock Exchange — Bonds

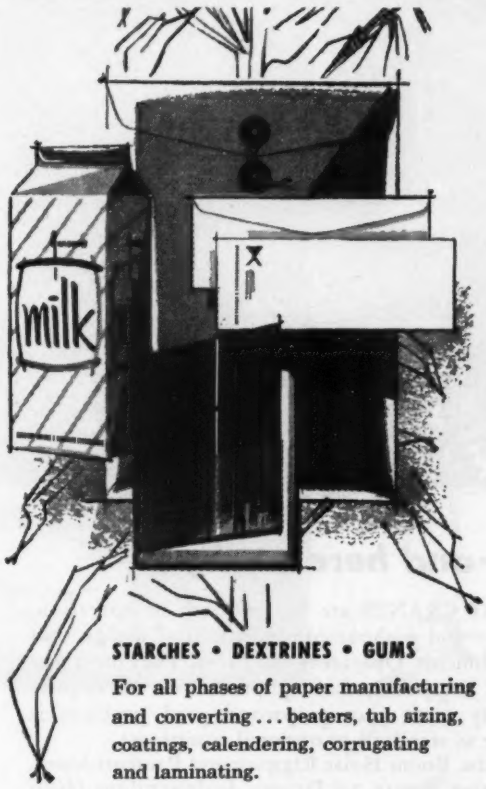
Champion P & F 4¾%	115	109
Champion P & F 3¼%	—	—
Diamond-Gardner 3%	—	94½
Kimberly-Clark 3%	87⅛	91
Mead 3%	—	—
Oxford 4¾%	110¾	108
Scott 3%	108½	103⅛

American Stock Exchange — Stocks

Allied Paper	12	12½
American Writing	32	35¼
Brown	13½	14¾
Puget Sound	23½	22¼

*Closing Bid and Asked Prices

Look what happened to the corn we took off the cob



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—Ruggedly built—the finest thing in boom hoist equipment on any machine. Independent of all other machine functions. Permits full boom control under power both up and down and without sacrificing either main drum.

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There are very few products you buy that do not use a product from corn in some way. Corn sugars and starches are used extensively in food processing. Starches aid in the textile industry, and the laundry industry—the clothes you wear needed corn. Corn makes better papers and packaging boards. Corn is necessary in drugs and medicines—in beverages and bubble gum.

Corn is our business at Clinton. In our modern plant we produce the finest products from corn—under the strictest system of quality control. And, Clinton research is constantly discovering new applications for corn in the quest for better living for everybody.

Clinton serves the PAPER industry

Clinton starches and dextrins will always meet your most exacting specifications. Consult your Clinton salesman. He will provide product information, arrange for prompt technical service, or assist you in any way possible.

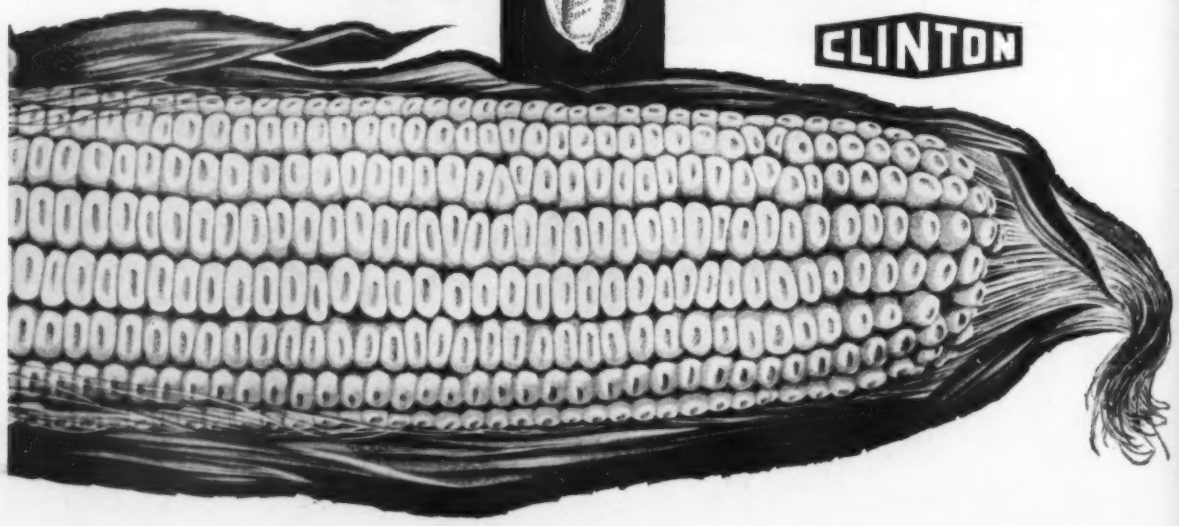
CLINTON CORN PROCESSING COMPANY
CLINTON, IOWA

CORN SYRUPS • DEXTROSE
STARCHES • DEXTRINS • SUGARS • OILS
LACTIC ACID AND OTHER PRODUCTS FROM CORN

If you can do it with CORN

you can do it better with CLINTON

CLINTON



NEWS of the INDUSTRY

U. S. Acquires rights to a British Process

The Du Pont Film Department of Wilmington, Del., has announced that United States has acquired the rights to a British process for extruding polyethylene and other polymers in the form of netting.

The use of the product for packaging and industrial applications is being evaluated. Information as to potential uses for the new material will be available upon completion of studies now under way, the company said.

100th Anniversary is Celebrated by Arkell & Smiths

Arkell & Smiths is celebrating its 100th anniversary at their plant at Hudson Falls, N. Y. The company is one of the oldest makers of paper bags.

The celebration coincided with the completion of Arkell & Smiths' transfer of all activities to its Hudson Falls plant, with vastly increased facilities for research, design, production and quality control in a scheduled output of over 400 million bags a year.

History of the firm dates back to Civil War days when it patented bag-making machines incorporating principles which are still basic in today's equipment. The company serves such fields as coffee, food agricultural, chemical and a host of other industries — supplying packages of film, foils, kraft and laminations.

Allied Paper Introduces Five New Paper Types

Allied Paper Corp. has announced the production of a new family of grades that are manufactured to one standard specification except for finish and preparation for various printing processes.

The group, consisting of five different paper types, are said to be characterized by superior cleanliness, opacity and brightness. Types are: custom offset, climax English finish, climax eggshell, lithobulk offset and typobulk eggshell.

Wausau Opens House to Celebrate 60 Years

Wausau Paper Mills Co. of Brokaw, Wis., is now celebrating its 60th year as a prime producer of fine writing and printing papers.

During the first week of June the company opened its doors to nearly 4,000 people who visited the mills to celebrate the company's "Diamond Jubilee Family Days."

Micropulping Technique

A micropulping technique has been developed by the Institute of Paper Chemistry. This technique, together with measurements of zero-span fiber tensile strength and fiber length is used as a means of identifying and evaluating trees selected and developed in genetic improvement programs.

One of the initial objectives of this project is the development of methods which will reveal and measure superior papermaking qualities in pulps made from candidate parent trees. Because fiber strength and fiber length are of such importance to such a large variety of paper grades, particularly in the south, they have been chosen as desirable pulp qualities with which to work in the initial phases.

The results to date indicate that there is a significant difference in fiber strength and fiber length of pulps made from different trees in a given stand. This suggests that fiber strength and fiber length might profitably be used by the geneticists as suitable criteria for wood evaluation in a tree improvement program.

Research Grants Announced

Seven new research grants in the TAPPI Research Program have been distributed among the Association.

Two Wood Chemistry Committee grants are in continuation of previous projects. No. 164, "The preparation and properties of polymerhomologous oligosaccharides of the cellulose

Nass River Now Open for Commercial Use

Timberlands bordering the glacier-fed Nass River in Northwestern British Columbia were opened to commercial logging for the first time in early June with the inauguration of regular log towing service from the Nass booming grounds to Prince Rupert, B. C.

Sea-going tug boats can haul approximately one million board feet of flat-rafted logs per trip on the two-day, 72-mile coastal voyage from the mouth of the Nass River to Prince Rupert where the logs are delivered to the sulfite pulp mill owned by Columbia Cellulose Co. Ltd., affiliate of Celanese Corp. of America.

Columbia Cellulose timber holdings in the Nass Valley comprise almost one-half of the logging area included in Tree Farm License No. 1, granted to the company in 1948 by the Provincial Government of British Columbia. Foresters estimate that standing timber in the Aiyansh block alone can supply the company's Prince Rupert Pulp mill's raw material requirements for the next 56 years.

series", is designed to advance the study of chemical properties of this series. No. 165, "The isolation of dimers from lignin", is concerned with the separation of individual compounds from lignin obtained by the alkaline hydrogenation of sugar maplewood, using the techniques of fractionation by solvents and counter current distribution.

Research grant No. 166, "Surface strength of paper", went to the Graphic Arts Committee for continuation of their work in furthering knowledge in predicting paper surface failures during the printing process, otherwise known as "picking".

The Paper and Paperboard group of the TAPPI Testing Division received Grant No. 167 for "The investigation of smoothness and compressibility of paper and paperboard as related to printability".

Grant No. 168, "The transfer and penetration aspects of ink receptivity", went to the Graphic Arts Committee.

Grant No. 169 was awarded to the Coating Committee for the continuation of its work at the University of Maine on the "Flow properties of paper coating colors."

The Fluid Mechanics Committee received Grant No. 170 for the continuation of their work on "Friction of paper stock in fittings". This work is being done at the University of Maine by its Chemical Engineering Department.

Forestry Notes

President Eisenhower was told that "emergency action" is needed to get Federal funds for permanent forest-fire control in Alaska. Seven national conservation organizations said in a telegram that a $250,000 cut recommended by the Budget Bureau and voted by Congress in appropriations for the Bureau of Land Management had jeopardized organized efforts to reduce fire losses.

Congress was asked to step up construction of roads and trails in national forests. This program calls for expenditure of 720 million dollars in 12 years for construction of roads and trails to permit the harvest of timber and tree planting in the forest.

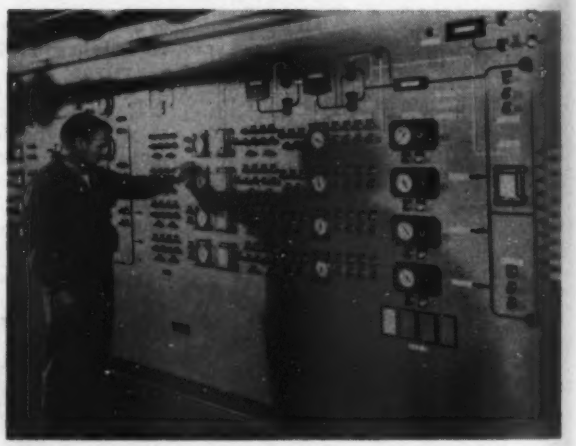
Squirrels will be assisting Manitoba's foresters in the job of harvesting pine cones. Hon. Gurney Evans, minister of mines and natural resoures, stated that the provident, hard-working squirrel is a compulsive collector of pine cones. The animal chops the cones from the tree and then proceeds to salt them away in hidden caches for use as future food supply. The foresters can then follow behind the busy harvester to gather up the surplus cones and the seeds they contain.

Recent Expansions in the Industry

Giant Control Center Featured At American Viscoses New Plant

American Viscose Corp. has installed what is said to be the largest control center in private industry at its new Marcus Hook, Pa., film plant. The plant has been credited with making possible a continuous production of high-quality cellophane at a date earlier than believed possible. The cellophane plant is presently producing in excess of 100 million pounds annually.

The equipment design and carefully selected extensive array of precise control instruments are the new aspects of the new Marcus Hook operation.

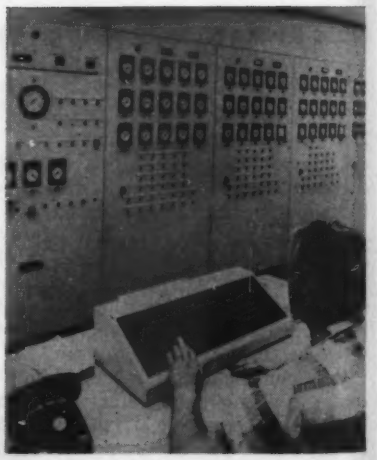


Master graphic panel for continuous control automatically through visual and recorded systems to regulate the supply of viscose to all spinning machines.

Logging typewriters in central control system are fully automatic in operation.

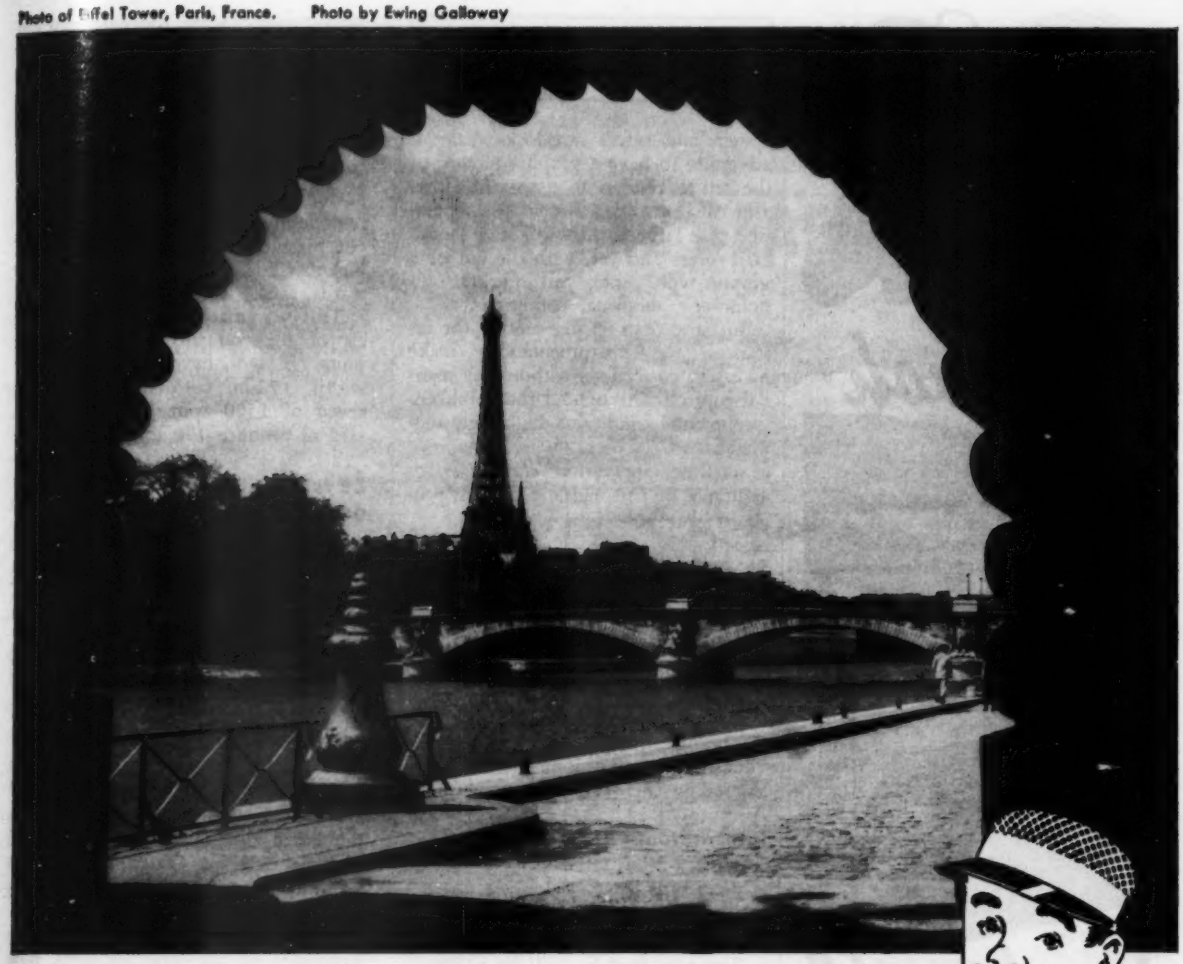
The instrumentation systems cover a broad range of types — from the simple industrial thermometer to a complex electronic scanning and data logging system.

Continuous processing has taken the place of batch operations wherever practical. From the raw material to the end product, instrumentation is essential to both economical operation and to the quality product that the plant is manufacturing. Important variables requiring measurement and control are at almost every stage of the processing. For instance, in the initial processing of the pulp sheets, for example, a single continuous process replaces two separate batch steps — thus eliminating the usually wider variations associated with manual regulation. Still another instance, the complexity of the control problem, alarm



Central control Trans Scan Log data system for maintaining indicated and printed evaluation of spinning machine operations.

Photo of Eiffel Tower, Paris, France. Photo by Ewing Galloway



HAM FELTZ says:

"Reminds me of HAMILTON Felts . . . they're engineered, too!"

MANUFACTURING Hamilton Felts
is a technical job requiring precise information

In the case of *your* felt order,
all details and specifications of each of
your paper-making or board-making machines
. . . and all details of the job each of *your*
felts must do are recorded on punched cards.

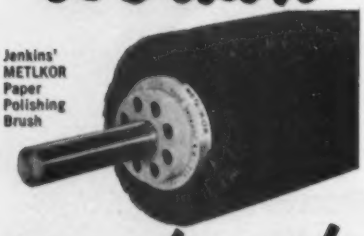
Your carefully woven Hamilton Felts are first
triple-checked in our own mill—then studied, in action.
on *your* machines. These facts
are recorded on a second punched card and filed.

Thus, you are assured of getting the same,
identical pre-sized felts engineered for satisfactory
performance on your machines—every time.

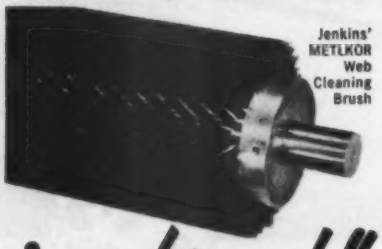
YOU CAN'T BEAT
Hamilton
FELTS

SHULER & BENNINGHOFEN, HAMILTON, OHIO

"a brush



is a brush



is a brush"

Poetically speaking, true! But there's no brush like a Jenkins' METLKOR brush. Paper Mill men everywhere say it's true. There are "Look-Alikes", "Just-as-Goods", "Steals", "Terrific Bargains" . . . but only one Jenkins' METLKOR. They are built better, to perform better, to last longer. Result . . . improved product, greater satisfaction and economy.

JENKINS' PAPER MILL BRUSHES

Blanket washer • Coating • Conveyor • Dampening • Dusting • Feed • Felt cleaning • Flocking • Fourdrinier wire cleaning • Nutmeg roll cover • Offset powder removal • Paint brush • Polishing • Scrap removal • Sieve • Spray • Static elimination • Void detector • Web cleaning.

BRUSHES FOR PRINTERS: Cylinder hold down • Dusting • Nutmeg roll cover • Offset dampener roll cleaning • Offset powder removal.

Specify Jenkins' METLKOR
the original . . . the best Metal-Core brush

METLKOR®
CYLINDER BRUSHES
and LIFEWOOD® WOOD BACKED BRUSHES

M. W. JENKINS' SONS, INC.
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News of the Industry . . .

system and safety interlocks make it advisable to have a graphic picture of the entire process to assist the operator. One man can oversee the operation of a large and complicated chemical process and yet, with the aid of a graphic-type panel, can quickly pinpoint any abnormal conditions.

In more than 95 per cent of the instances, the instrumentations make necessary corrections without any manual control. Throughout the plant, environmental conditions are closely regulated and elaborate controls monitor, at all times, the various conditions for assurance of personal and product protection.

St. Regis to Start Production on New Product

The West Carthage, N. Y. mill of St. Regis Paper Co. is in the process of modifing its paper manufacturing equipment for the production of a new-type stretchable kraft paper.

The new product is to be known as "duostress", a development now considered in the semi-commercial stage.

International Plans Third Machine

Plans are being made to install a third paper machine at International Paper Co.'s new Pine Bluff mill.

The new machine will be a 209-in. Beloit machine and will be equipped to manufacture lightweight directory papers and other groundwood printing grades to meet the expanding demand in the south and southwest.

Total cost for this expansion program is estimated over $13,000,000 and is expected to be completed by January of 1961.

$125-Million Expansion Plan Announced by National Gypsum

A five-year, $125-million expansion program has been planned by National Gypsum Co. It will include acquisitions, new plants and increased production and existing facilities.

Melvin H. Baker, chairman of National Gypsum, stated: "The primary objectives of National's 1960-65 expansion program are to expand our markets to include the entire North American continent, and to substantially increase sales volume and income".

The company will build three new gypsum plants, one in California, one in Illinois and one in Ohio. The company also plans to expand its cement operations by acquiring several other cement mills, since the company entered the cement business by acquiring the Huron Portland Cement Co. of Detroit.

Construction Started at Nekoosa for New Machine

Construction has begun on a major remodeling to house a new Beloit paper machine at the Nekoosa mill of Nekoosa-Edwards Paper Co., Port Edwards, Wis.

This new machine will be the largest of the company's 11 production units. It will have a 195-in. wire width, 172-in. trim and a designed speed of 1500 fpm. The machine is said to produce 170 tons per day.

CZ is Investigating Denver Area as a New Mill Site

Crown Zellerbach is considering the possibility of establishing a newsprint mill in the vicinity of Denver, Colo., to supply its newspaper customers in the mountain-states region.

If the company decides to proceed in establishing a mill in the area, the project is expected to take approximately two to three years to complete.

Ownership Changes

Container Corp. of America has purchased *Arizona Container Corp.* of Phoenix. Arizona Container will continue to serve its present customers as a wholly-owned subsidiary of Container Corp. It will also help supply customers in the Phoenix area now served by Container Corp's corrugated shipping container plant in Los Angeles.

Crossett Co., parent of Crossett Paper Mills, has purchased the assets of *Triangle Paper Bag Co.* of Covington, Ky., for which Crossett previously supplied the raw material.

Personal Products Corp., a Johnson & Johnson subsidiary, has purchased the cellulose wadding property of *Stonebridge Paper Co.* of Wilmington, Ill., which will be operated as a Personal Products subsidiary.

Inland Container Corp. of Indianapolis, Ind., and *Mead Corp.* of Dayton, Ohio, have announced a joint program for the expansion of their mutually owned *Rome Kraft Co.* of Rome, Ga. The expansion will be in the corporate name of *Forest Kraft Co.* The new company will build a 500 ton-per-day mill to produce kraft to be divided equally between Inland and Mead. In the new set-up, Inland and Mead will jointly own not only Forest Kraft, but also *Georgia Kraft Co.* and Rome Kraft Co.

Hammermill is to exchange common stock to an approximate value of

over $3 million for the entire common stock of *Beckett Paper Co.* of Hamilton, Ohio. This places Hammermill interests in Ohio as well as in Pennsylvania and Michigan.

Champion Paper & Fibre Co. is paying 30,000 shares of common stock and an undisclosed amount of cash for the acquisition of *Buffalo Envelope Co.* in a $1 million deal.

St. Regis Paper Co. has announced plans to offer a stock exchange to holders of stock of *Cupples-Hesse Corp.* of St. Louis. Cupples-Hesse produces envelopes and shipping and merchandise tags.

The boards of directors of *United Board & Carton Corp.* and *Interstate Container Corp.* have announced that they have agreed unanimously to an amalgamation, whereby United Board will be the surviving corporation. The proposal is being submitted to the stockholders.

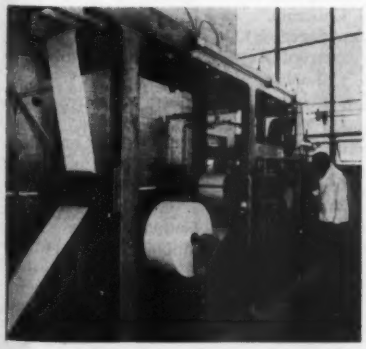
Flintkote Co. has acquired *Glens Falls Portland Cement Co.* of Glens Falls, N. Y. Glens Falls will be operated as a Flintkote division.

Research Center Gets High-Speed Paper Coater

A modern high-speed paper coater has recently been installed at the Menlo Park, N. J. research center of Minerals & Chemicals Corp.

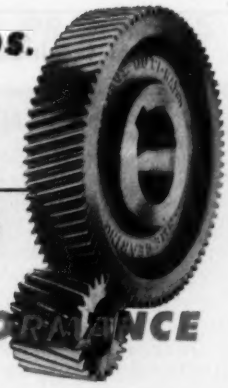
This new equipment will be used to assist coated paper and paperboard manufacturers in the development and evaluation of present and future coating formulations and methods. Built by Wheeler Roll Co. of Kalamazoo, Mich., the new coater has a top speed of 2000 fpm.

The coater (pictured below) now enables research personnel to improve their study of all phases of coating technology—including coating color reology; pigment and adhesive evaluations; performance of coating colors on the machine; calendering characteristics; and printability of coated paper.



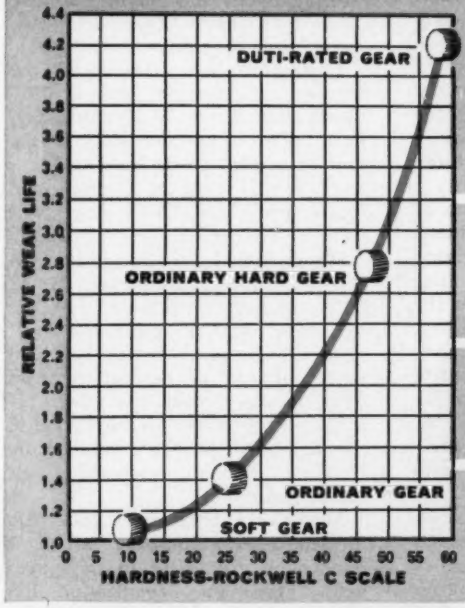
HERE'S WHY FOOTE BROS.

Duti-Rated LIFETIME GEARING



GIVES BETTER PERFORMANCE ...LONGER LIFE

GEAR PERFORMANCE COMPARISON CHART



DUTI-RATED GEAR— Hardened after cutting. Precision processing permits maximum hardness while holding accuracy within extremely close tolerances.

ORDINARY HARD GEAR— Hardened after hobbing and shaving; hardness limited to maintain reasonable accuracy.

ORDINARY GEAR— Hardened before cutting; hardening limited to maintain machinability.

SOFT GEAR— Low hardness—excessive size required because of low capacity.

LINE-O-POWER Speed Reducer

AND YOU GET Duti-Rated Gearing in These Foote Bros. Drives

LINE-O-POWER Right Angle Drive

SHAFT-MOUNTED Drive

LINE-O-MOTOR Drive

Vertical LINE-O-MOUNT Speed Reducer

Write for SHAFT MOUNTED and LINE-O-POWER Catalogs
See how You can get more for Your Drive Dollar!

100 YEARS SERVING INDUSTRY 1859-1959

FOOTE BROS.

Better Power Transmission Through Better Gears

FOOTE BROS. GEAR AND MACHINE CORPORATION
4573 SOUTH WESTERN BOULEVARD • CHICAGO 9, ILLINOIS

News of the Industry . . .

Allied News Notes . . .

Hercules Powder Co. will build a $1 million plant at Burlington, Ont., to process crude tall oil. Products of the new plant will be rosin and fatty acids. Completion of the new plant is set for June 1960.

Engineers and executives from the home and regional offices of the **J. O. Ross Engineering Division of Midland-Ross Corp.** met recently for three days to discuss methods of further standardizing and simplifying the company's design procedures.

Cameron Machine Co. of Dover, N. J., has formed a subsidiary company to be known as Cameron Leasing Inc. The new company, located at the same address of the parent company, is set-up to handle the leasing of complete installations of slitting and roll winding machines and roll production equipment.

Fitchburg Screen Plate Co. Inc. of Fitchburg, Mass., recently purchased the **Wickwire Spencer Perforating Division of Colorado Fuel & Iron Corp.** The new company bears the name of National Perforating Corp. and is located in Clinton, Mass. Sales to the pulp and paper industry will be handled through Morey Paper Mill Supply Co., 309 So. St., Fitchburg, Mass., which is an affiliated company under the same management.

Protective Coatings Corp. of Clifton, N. J., has installed a complete Egan extrusion coating line designed to handle polyethylene coating of paper, paperboard, films and foil. The unit will be used primarily for the production of flexible packaging materials. It may also be used for sandwich lamination.

Morey Paper Mill Supply Co., selling agent for **Scapa Dryers Inc.**, has announced that Scapa has unanimously won the legal suit brought against it by **Abney Mills** of Greenville, S. C. The judgment which the Court of Appeals reversed and enjoined the Hindle-Scapa interests from using or operating Hindle looms in the manufacture of dryer felts in this country. The effect of the reversal is to confirm the right of Scapa Dryers to continue to operate and to enlarge the capacity of its plant located in Waycross, Ga., which has been supplying Scapa Dryer Felts woven on Hindle looms to the paper industry.

Frank Messer & Sons Inc. of Cincinnati has been awarded the general contract for construction of the new Champion Paper & Fibre Co. office building in Hamilton. Completion of this project is expected in 20 months.

Bauer Bros. Co. of Springfield, Ohio, has been issued a United States Letters Patent (No. 2,893,-909) on the use of its continuous screw press in the pulp and paper industry. This machine, sold under its registered trademark "Pressafiner", is used for high pressure expression of cooking liquors or other fluids from wood chips or agricultural residues of a fiberous nature.

Appleton Machine Co. has appointed **Marshall & Williams Equipment Co.** of Greenville, S. C., as southeastern sales representative covering South and North Carolina, Georgia, Alabama, Tennessee, Mississippi and Virginia.

Torrington Co. announces the opening of a district office at 244-246 Walker St., S. W., Atlanta, Ga. This office is another step in the field expansion of its Bearing Divisions at Torrington, Conn. and South Bend, Ind. Larry Paine will serve as district engineer.

Huyck Felt Co. conducted its 13th Felt Workshop at Rensselaer, N. Y. Discussions covered were: felt design, the use of synthetics, felt cleaning, chemical treatments and other subjects of current interest. Also discussed were the effects of papermaking chemicals on felts and the new instruments employed by Huyck to measure on-machine felt performance.

Miles Laboratories Inc. has formed a new company which is said to be prominent in the paper field. This new organization has been named the **Miles Chemical Co.** and is one of four main divisions of the parent corporation. It will consolidate into one, the **Sumner Chemical Co.** of Zeeland, Mich., makers of fine organic chemicals; **Takamine Laboratory Div.** of Clifton, N. J., manufacturers of industrial enzymes; and **Citric Acid production** of Elkhart, Ind.

Hooker Chemical Corp. has been issued U. S. patent (2,889,119) for the development of automatic and continuous processes used in producing high-quality calcium hypochlorite bleach liquor at rates up to 20,000 gal. per day and higher.

Dayton Rubber Co. has formed a new company in Chicago. **Dayton Industrial Products Co.** (the former Mechanical Division), a division of Dayton Rubber Co., will establish headquarters in a building now under construction in the Melrose Park area west of Chicago. All activities of Dayton's former mechanical goods sales division will be incorporated in the new company. Robert G. Burson, a vice president of Dayton Rubber, will be in charge of the new company. The plant is expected to begin operation in late July. Dayton is also construction a manufacturing plant in Springfield, Mo., which will begin operations early this fall.

Coming Events

TAPPI

August 17-21—Tenth Testing Conference, Multnomah Hotel, Portland, Ore.
September 9-11—Fundamental Research-Wet Strength Conference, I.P.C., Appleton.
September 15-17—Ninth Corrugated Containers Conference, Jung Hotel, New Orleans.
September 21-23—Fourteenth Paper Plastics Conference, Edgewater Beach Hotel, Chicago.
October 7-9—Fourth Deinking Conference, Roger Smith Hotel, Holyoke, Mass.
October 12-15—Fourteenth Engineering Conference, Penn-Sheraton Hotel, Pittsburgh.
November 4-7—Thirteenth Alkaline Pulping Conference, Rober Meyer Hotel, Jacksonville, Fla.

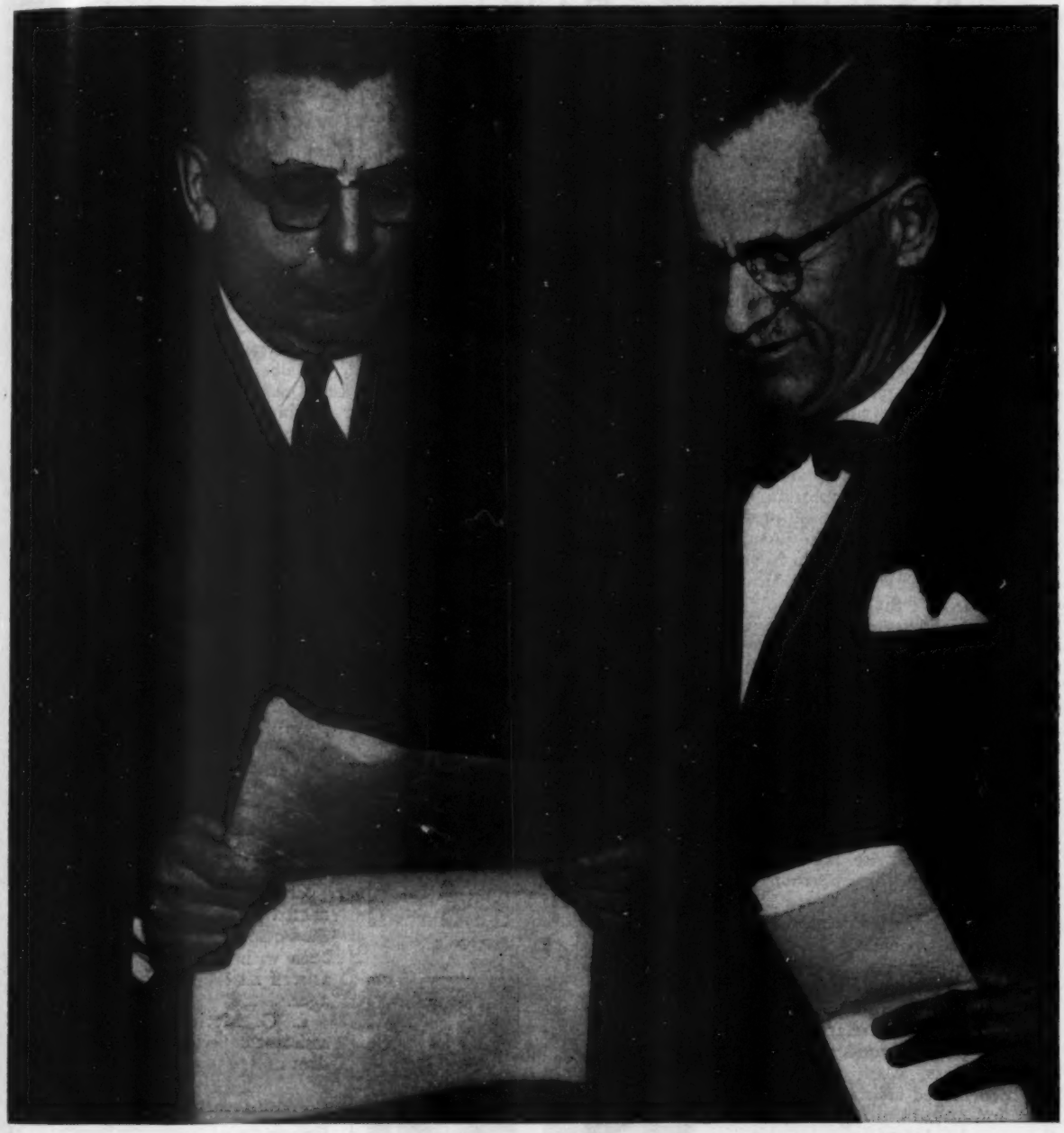
PIMA

September 1-3—New York-Canadian Div., Chanteclerc Hotel, Ste. Adele, Que.
September 9-11—Northwestern Div., Hotel Leamington, Minneapolis, Minn.
September 17-19—Northeastern Div., Poland Spring House, Poland Spring, Me.
September 30 - October 1—Pennsylvania-New Jersey-Delaware Division, Pocono Manor Hotel, Pocono Manor, Penn.
October 2-3—Connecticut Valley Div. (joint meeting with New England section of Tappi), Great Barrington, Mass.
October 11-15—Southern and Southeastern Division, Williamsburg, Va.

OTHER MEETINGS

August 29-September 10—Fifth World Forestry Congress, University of Washington, Seattle, Wash.
August 31-September 4—Thirty-fourth Norelco X-ray school, Sir Frances Drake Hotel, San Francisco.
September 4-5—Graphic Arts Association Executives, Hotel Plaza, New York City.
September 6-12—Seventh Educational Graphic Arts Exposition, New York Coliseum.
September 9-12—Electron Microscope Society of America, Ohio State University, Columbus, Ohio.
September 10-12—Wood Industries Conference, Portland, Ore.
September 13-14—Pacific Coast Conference of the National Association of Waste Material Dealers, Fairmont Hotel, San Francisco, Calif.
September 14-16—National Paper Trade Association convention, Conrad Hilton, Chicago.
September 20-25—Annual Conference of America, Chicago Amphitheater, Chicago.

DRAMATIC MOMENTS IN PAPER-MAKING PROGRESS



Aubrey Crabtree, President of Fraser Paper, Ltd., and Mill Manager J.W.D. Hierlihy are shown here "center stage" in one of the paper industry's most exciting events—the first run of a newly rebuilt machine. In their hands is paper produced by their Fourdrinier machine, which was completely rebuilt by Pusey and Jones and is now in service at Fraser's Madawaska, Maine, mill.

It has a completely new Fourdrinier, a 228" wire width, 100' 0" wire length, 2000 fpm speed, and was preassembled at the Pusey and Jones plant for faster installation and on-time start-up. A vacuum pickup arrangement and an after-dryer section with completely enclosed gearing were added.

Pusey and Jones, the first company in the United States to specialize in the manufacture of paper-making machinery, continues to pioneer with such developments as the Automatic Air Guide System® and a new Differential Hydraulic Drive. May we help you with a complete machine or a component specially designed for your needs?

THE PUSEY AND JONES CORPORATION

WILMINGTON 99, DELAWARE

EXPORT AGENTS: THE PUSEY AND JONES INTERNATIONAL CORP., 90 BROAD ST., NEW YORK 4, N. Y., U. S. A.

Fourdrinier Machines • Cylinder Machines • Yankee Machines • Slitters, Winders, Unwinders, Brakes • Mechanical Drives • Rolls • Dryers • Calender Stacks and Reels • Differential Drives • Automatic Air Guide System

NAMES *in the* NEWS

Crown Zellerbach Corp.

A general realignment of executive duties and responsibilities has been announced by Crown Zellerbach Corp.

A. B. Layton has been elected chairman of the newly established Finance Committee. To be free from day-to-day administrative duties, Layton relinquishes his post as president and administrative officer.

Reed O. Hunt, who has been serving as executive vice president and chief operations officer, has been elected president and chief executive officer of the corporation.

P. T. Sinclair, who has been president of Crown Zellerbach Canada Ltd. (with headquarters in Vancouver), has been elected executive vice president of the corporation.

G. H. Gallaway, who has been assistant vice president for manufacturing at the corporate headquarters in San Francisco, will replace Sinclair.

D. J. Benjamin, vice president of the corporation and general manager of the Western-Waxide Division, now assumes the new post of vice president for packaging operations.

Lloyd Merwin, vice president in charge of converting operations of the Gaylord Container Corp. Division, will continue his present duties and report to Benjamin. C. S. Cullenbine, secretary of the corporation, has been elected vice president for administration and will also continue to serve as secretary.

F. O. Boylon, resident manager of the Camas, Wash., paper mill, has been named assistant vice president for manufacturing at the San Francisco headquarters.

R. A. Butler, assistant resident manager at Camas, now will become resident manager.

Robert B. Roberts, printing paper sales manager at Fresno, has been promoted to Northern regional sales representative for Crown Zellerbach printing papers.

A. B. Layton

R. O. Hunt

P. T. Sinclair

G. H. Gallaway

D. J. Benjamin

F. O. Boylon

C. S. Cullenbine

R. A. Butler

Diamond Gardner Corp.

William H. Aiken has been appointed director of research and development. His office will be in Middletown, but he will engage entirely in corporate research projects. Aiken joined Gardner in 1952 as technical director. In 1958 he was promoted to director of research and development, paperboard products.

Richard D. Williams has been named director of industrial and public relations. In this new post, he becomes a member of the Division's operations committee.

Thomas G. Zentner has been selected as director of research and development of the Division. Zentner's first job with Gardner was as a mill technician in 1952. In 1956 he became assistant technical director, carton plant development.

Delbert C. Meyer will now direct the maintenance, power and engineering departments as director of engineering.

Richard J. Minges has been promoted to chief project engineer; Henry E. Brouch to superintendent of maintenance and power of the Lockland operation.

Nekoosa-Edwards Paper Co.

Joseph H. Smart has been named superintendent of the Nekoosa paper mill of Nekoosa-Edwards Paper Co. He will succeed Arthur Sarver who has been mill superintendent for the past 12 years. Sarver will continue in the Nekoosa paper mill as staff superintendent. The reason for this change in assignment is to prepare for Sarver's retirement, and to assure a smooth transition while he is still available in an advisory capacity.

Clarence Kingston has been named paper mill superintendent of the Potsdam mill of Nekoosa. He has been with Nekoosa since May 1958 as staff assistant to the resident manager.

L. G. McGowan was appointed assistant superintendent at the Potsdam mill.

Consolidated Water Power & Paper Co.

Bert F. Raprager, paper machine consultant for Consolidated, retired May 31 after 30 years of service with the company and 58 years in the paper industry. He joined Consolidated in 1959 as Wisconsin Rapids Division's paper machine superintendent and played an important role in the development of Consolidated coating process in early 1930.

Three appointments have been made at the Biron Division. They

are: Max Hughson as technical manager; James Schad as technical supervisor; and John H. Barrette as assistant superintendent of the yard and fiber production.

G. Kent Dickerman Jr. has joined the Appleton Division as a chemist in the division's technical department. He was previously employed as a chemist by Minnesota Mining & Mfg. Co. since 1956.

John P. Bronson has been appointed as sales manager of the Box Board Division at Monroe, Mich. Bronson joined Consolidated in 1945 as a laboratory technician. In 1955, he was placed in box board sales.

Allied Personalities

Walter T. Parry has joined National Starch & Chemical Co. (Canada) Ltd. as a technical sales representative. He will handle the promotion of specialty starches and resins to the paper industry.

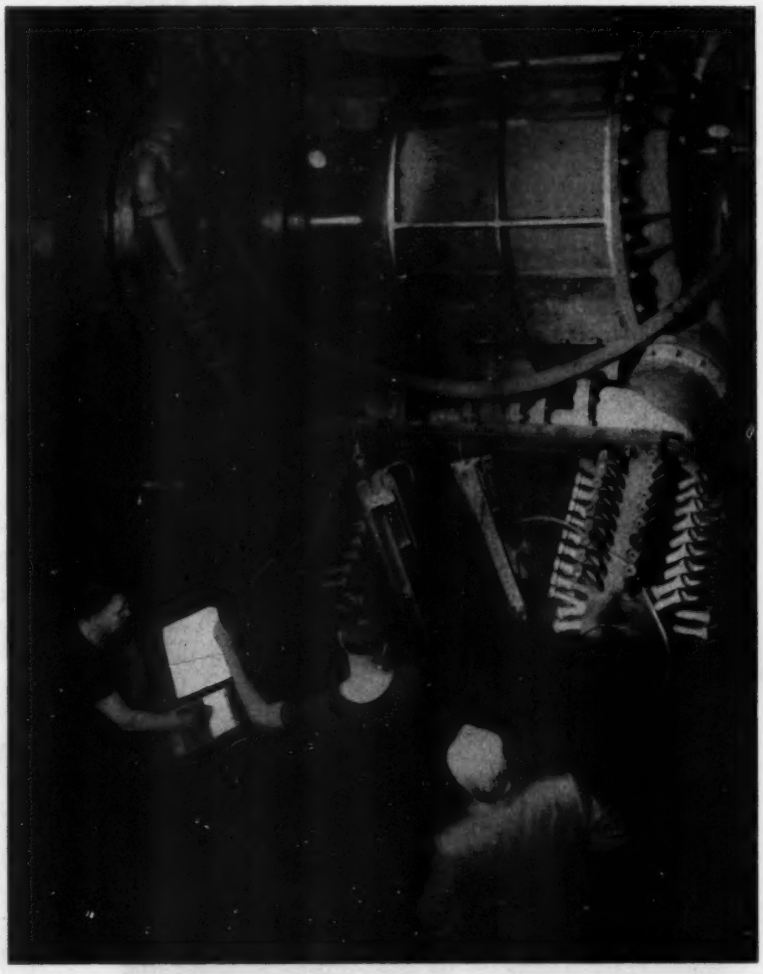
Paper Clay Sales Div. of Minerals & Chemicals Corp. of America has recently appointed **W. E. Welliver** and **Thomas C. Morganstern** as regional technical sales representatives to the paper industry.

Beloit Iron Works of Beloit, Wis., has made the following announcement: **Donald R. Simonds,** sales manager, has been promoted to vice president. **Francis G. Ramsden,** associated with the company and the paper industry for over 25 years, will be the new sales manager. **Lloyd Hornbostel,** vice president in charge of engineering and research, will soon retire after serving with the company for 33 years. Hornbostel will be succeeded by recently-promoted **E. D. Beachler,** vice president in charge of engineering, and **E. J. Justus,** vice president in charge of research.

General Chemical Div. of Allied Chemical Corp. announces the appointments of **James E. Kelley** as assistant manager of sales in its New York executive office. **Mr. O. W. Swenson, Jr.** will replace Kelley as manager of the company's Chicago sales office, after managing the Detroit office for the last five years.

Hyuck Felt Co. of Rensselaer, N. Y., and Aliceville, Ala., announces the appointment of **Dr. Dan B. Wicker** as vice president and director of research and development. Since joining Huyck, he has pioneered in applying scientific instrumentation to the manufacture, testing and evaluation of paper-ma-

Rated performance of every Nash Vacuum Pump is assured by this precise laboratory test



Rated capacities of Nash Vacuum Pumps are not theoretical. Every Nash Pump is tested individually. Air capacity is determined by delivery thru accurately machined and calibrated orifices. Related vacuum is measured by precise mercury column, and horse power is recorded electro-dynamically. Records of these tests are retained by us, and certified copies are available to Nash Pump owners.

That is one of the reasons why Nash Vacuum Pumps are installed in over a thousand leading Paper Mills. An engineer from Nash will be glad to survey your mill, and make recommendations, entirely without obligation to you.

NASH ENGINEERING COMPANY

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Names in the News . . .

chine felts. His work with the Betaray gauge has made it possible to measure felt performance quantitively on the paper machine so that felts may be custom-engineered to meet specific application requirements.

Charles S. Adams was recently appointed to the newly created post of assistant manager of sales for Sandy Hill Iron & Brass Works. **Loren G. Gallup,** a 30-year veteran of the company is manager of sales.

John J. Rounds, president of John J. Rounds Co. of Lynnfield Center, Mass., has been appointed sub-agent in New England for Stickle Steam-Specialties Co. of Indianapolis, Ind. He will assist **Peter J. Abel,** Stickle's eastern district manager in the engineering and promotion of sales.

Bauer Bros. Co. of Springfield, Ohio, has made the following announcement: **Lloyd Heard** has been appointed manager of digester sales, succeeding the late **C. L. Durkee,** and will be assisted by **James Starrett** of the company's engineering department. **Patrick J. Shouvlin** will replace Heard as manager of the company's Southern Division, headquartered in Jacksonville, Fla. Working with Shouvlin are **Herman Fryer,** located in Memphis, Tenn.; and **C. C. Hendricks,** located in Brevard, N. C. **David M. Shapleigh** has been appointed manager of the Eastern Division and will personally serve accounts in New York City, New Jersey, Pennsylvania, Maryland and Delaware.

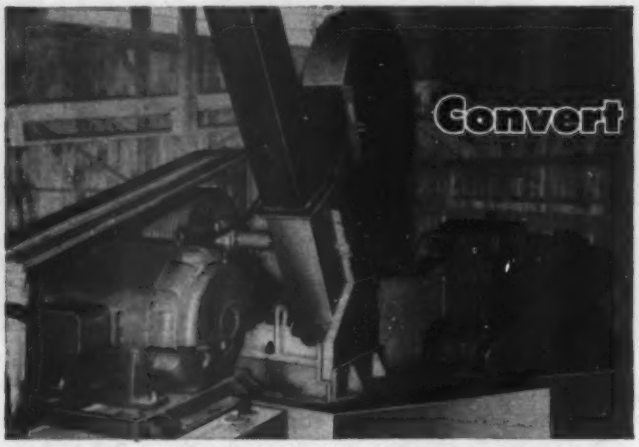
Howard E. Ellis has been appointed as representative to serve the paper industry in Wisconsin and Minnesota for Shuler & Benninghofen of Hamilton, Ohio. Ellis joins Shuler & Benninghofen, manufacturers of the Hamilton felt, after many years' experience in the paper industry, most recently as general superintendent of the Fox Paper Co., Lockland, Ohio. **Adrian Barber,** who has represented the company in the Wisconsin-Minnesota area since early in 1958, will continue to represent them in Michigan.

Perkins-Goodwin Co. has announced the appointment of **Richard T. Trelfa** as a vice president and director. Trelfa joined the firm in June of 1958 as director of technical services. In connection with his new duties, he will move into the New York headquarters. The company has also announced the appointment of **Thomas L. Stirling** as director of marketing for the paper division. Stirling was formerly vice president in charge of sales for Champion-International. He will also be located in the New York office.

W. R. Spencer will now represent the Orr Felt & Blanket Co. in the south-central territory. Spencer assumes this position made vacant by the untimely death of **George Witham.**

Hugh P. Quinn has joined the technical services staff of the Lindsay Wire Weaving Co. of Cleveland. He has acted in a service capacity to paper mills for more than 20 years. His services are now available to paper manufacturers in connection with the use of fourdrinier wires.

Chemipulp Process Inc. of Watertown, N. Y., announces the appointment of **A. E. Theisen** as president to succeed the late **Albert D. Merrill.** Theisen was also appointed as secretary of the company.



Carthage 60" Slab Chipper with horizontal feed. A five knife machine furnished with or without power feed and with gravity or blowing discharge. Capacity approximately 10 cords per hour. A companion chipper to our popular 39" horizontal slab chipper.

Convert Sawmill Waste into $$ with a Carthage 60" Slab Chipper

Slabs, edgings, rounds and other waste wood are fast becoming an important source of chips for pulp mills—an important source of needed profit for hundreds of sawmills.

Cash in! There's a Carthage waste-wood chipper (size range 39" to 64") exactly suited to your requirements. Don't miss this big extra income.

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Please send full information on Carthage waste-wood chippers.

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St. or Rd. .....
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NOW.... PROMPT MOLTEN SULPHUR DELIVERIES

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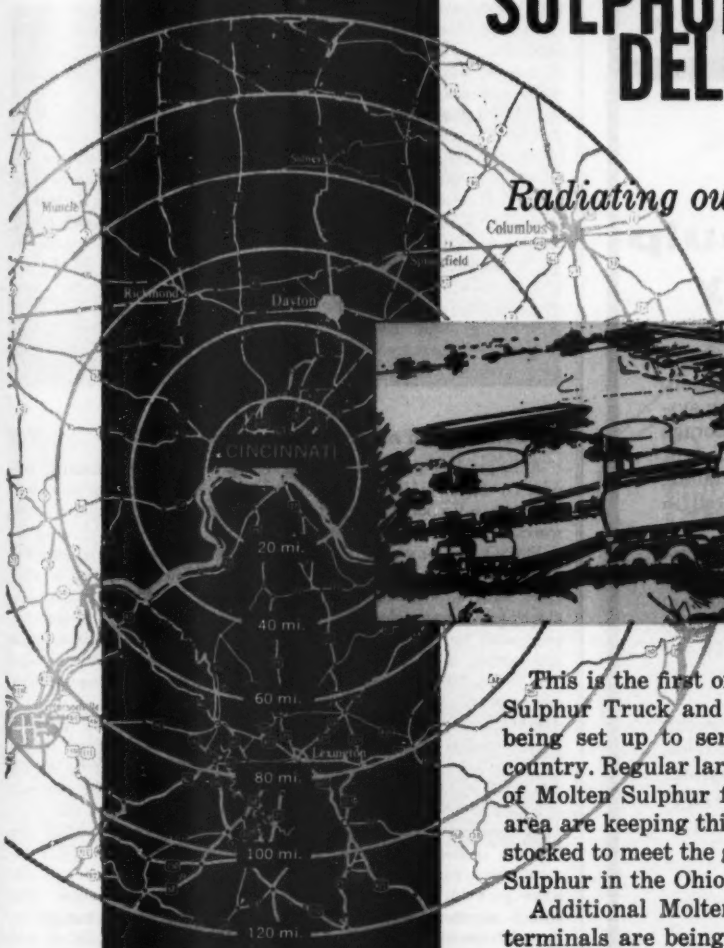

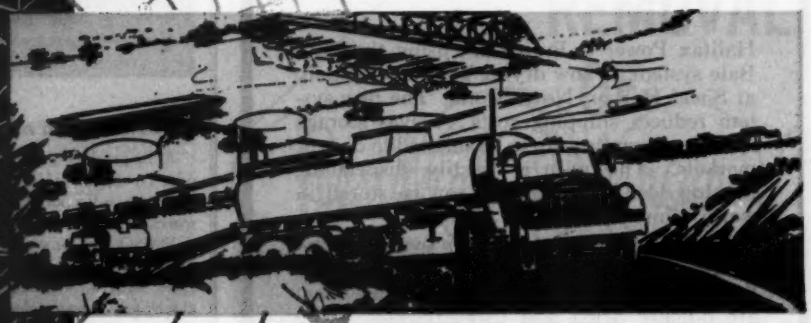

This is the first of the TGS Terminal Molten Sulphur Truck and Rail Distribution Stations being set up to serve industrial areas of the country. Regular large tonnage barge shipments of Molten Sulphur from our mines in the Gulf area are keeping this Cincinnati Terminal well-stocked to meet the growing demand for Molten Sulphur in the Ohio River area.

Additional Molten as well as Solid Sulphur terminals are being considered for other parts of the country.

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Molten Sulphur in tank *cars* can be delivered to any point in the States or Canada from our nearest mine or recovery plant. Barge deliveries of Molten Sulphur are available on all navigable inland waters. Solid Sulphur, as for many years, is deliverable all over the world. Large inventories at our mines assure industry it will get its supplies when needed.

TYPICAL DRY-BALE SYSTEM

Halifax Power & Pulp Ltd.

dries groundwood pulp to 90% air-dry

Halifax Power & Pulp Ltd., using the Dry-Bale system, is now drying groundwood pulp at Sheet Harbor, Nova Scotia. The new system reduces shipping costs . . . saves storage space . . . permits pulp to be shipped to distant markets. The pulp is readily dispersible, requires less handling, and can be stored in warm climates.

An integral part of the new system is the Heil dryer. A stream of hot air carries the fluffed pulp through the dryer . . . fine fibers are quickly dried and carried away, while wetter, heavier fibers move more slowly for longer exposure to the drying medium. Result: uniform drying of all fibers.

Compound showering flights on each of the three drums eliminate surging and provide maximum utilization of the drying medium.

For descriptive literature on the new Dry-Bale system and the Heil dryer, write The Heil Co.

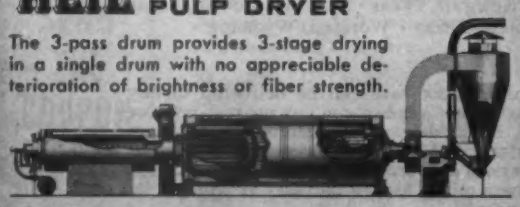
THE HEIL CO.

(Manufacturers of the Arnold Dryer)

3000 W. Montana St., Milwaukee 1, Wisconsin

HEIL PULP DRYER

The 3-pass drum provides 3-stage drying in a single drum with no appreciable deterioration of brightness or fiber strength.



FOREIGN ABSTRACTS

International meeting on corrosion

This was an all-Soviet meeting on metal corrosion and its prevention. It was also attended by technical men from the U.S.A, Great Britain, Germany, Hungary, Czechoslovakia, Poland and Yugoslavia. It was held in Moscow in May 1958.

Such problems as the mechanism of corrosion; underground corrosion; inhibitors and protective coatings; chemical treatment of metals; and the use of non-metallic, chemically inert substances were discussed at committee meetings.

The following papers were presented to the entire assembly: *The theory and kinetics of electro-chemical and metal corrosion,* by A. N. Frumkin; *The electro-chemical theory of corrosion,* by N. D. Tomashov; *The deterioration of metals by the concomitant action of corrosion and mechanical factors,* by S. G. Vedenkin; *Corrosion inhibitors,* by S. A. Balezin; *The theory of atmospheric corrosion,* by I. L. Rosenfeld; *Corrosion in oxidizing media,* by V. P. Batrakov; *The principle of corrosion prevention by the use of non-metallic materials,* by I. Y. Klinov; and *The present status of electroplating,* by N. T. Kudryavtsev.

B. V. Lopatin, *Bumazh. Prom.* 33, No. 9, 29 (Sept. 1958) {orginal in Russian) through *Abstr. Bull. Inst. Paper Chem.* 29, 1162 (1959).

Solvent action of dimethyl sulfoxide

A by-product in the kraft cook is the malodorous dimethyl sulfide. By means of a catalytic oxidation, this can be converted into dimethyl sulfoxide (DMSO) which is now being produced commercially.

DMSO has proved to be a good general solvent. For example it dissolves certain gases like ammonia and acetylene, and is miscible with a large number of organic liquids like the alcohols, aldehydes, ketones, low-molecular organic acids, etc. It is not micible with straight-chain hydrocarbons, like heptane. Mineral acids and certain salts are appreciably soluble in DMSO; this is also true for certain high polymers like nitrocellulose, cellulose acetate, and polyvinyl alcohol.

DMSO does not dissolve nylon, polyethylene and paraffin waxes; certain of these polymers can be applied in various manufacturing processes in which DMSO is used. Most of the metals are not corroded by pure DMSO; this is true even in the presence of water, when the metal is submerged 40 days at 20 to 60° C.

In combination with certain other organic liquids, DMSO can dissolve certain, otherwise difficult soluble compounds. (For example four parts of DMSO and one part tetrahydrofuran can dissolve polyvinyl chloride.) DMSO is extremely hygroscopic. The author summarizes its physical properties and their changes on the addition of other solvents. Pure DMSO melts at 18.45° C. and boils at 180°. In the presence of 25-per cent water, the boiling point is lowered to 126°.

The solubility of various cellulose ethers in DMSO is discussed. Methylcellulose, ethoxyethyl cellulose, methoxyethyl cellulose are all soluble; carboxymethyl celluose is amost insoluble in DMSO. When applied to semi-chemical pulps high in lignin, DMSO proved to be a poor delignifying agent, but when 0.2 per cent hydrochloric acid was added, most of the lignin could be removed.

In the case of a semi-chemical neutral sulfite pulp, DMSO containing little acid removed most of the lignin at 170° within about 3 hrs. The residual pulp retained only 1.8 per cent lignin. With 95 per cent DMSO alone and digesting at 170° C., coniferous woods were not delignified. However when 0.2 per cent sulfuric acid was present, at 160° and using a digestion period of 4 hrs., satisfactory pulps were obtained, especially when these were rinsed with DMSO prior to washing with water.

DMSO containing appreciable amounts of water, even when acid was added, was an unsatisfactory pulping agent. From very limited preliminary studies, it is possible that DMSO, even without acid addition, may be able to pulp certain hardwoods, but further work is required, and the cost of DMSO is still well out

of the range of pulping chemicals. DMSO appears to be a good solvent for certain proteins, without seriously altering their chemical properties.

Two tables and 19 references are given. F. A. Abadie-Maumert, *Papeterie* 81, No. 3, (alternate pages) 187 to 197 (1959) (in French).

New power plant of Oy Haukas Ab (Finland)

A hydroelectric plan was built on the Pielijoki River about 4 kilom. south of the old (now dismantled) Kaltimo board mill.

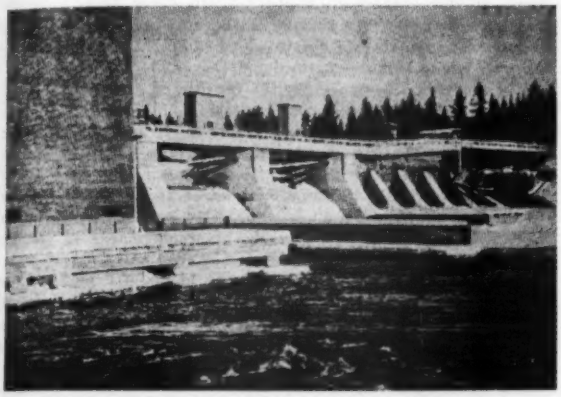


Fig. 1

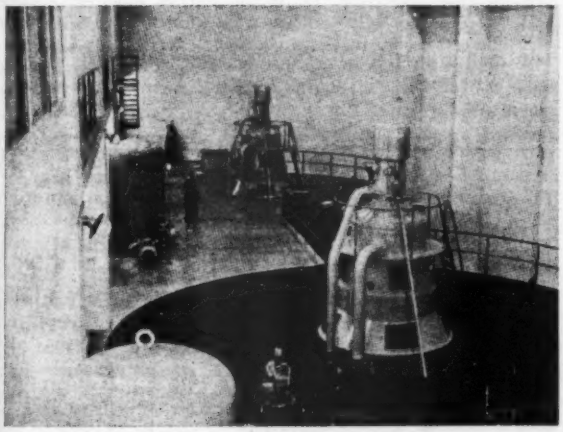


Fig. 2

The dam of the power plant is shown in Fig. 1 and the generator room in Fig. 2. The plant makes use of the drop between Lake Hiirenvesi and Lake Alusvesi. The annual output is estimated at 135 million kwh.

Anon. *Paperi ja Puu* (Finland) 41, Special No. 4a, 129 (1959) (in English).

Damping of vibration and noise in a paper mill

Five years ago, it was planned to install vibration dampers for a hydro-refiner, jordans and for Nash conical-suction pumps in a new paper mill built at Veitsiluoto, Finland.

The paper gives a brief report on the results of using two different damping devices, which served to lower both vibration and noise. Descriptions are given of different phases of actual mill installations and of the damping effects.

Besides effective damping of the vibration, noise damping was achieved since the plan involved the complete isolation of the machinery from the main mill building. The result was that any noises produced could be prevented from penetrating the building.

Thirteen figures are given. V. Nurminen. *Paperi ja Puu* 41 No. 4a 195-91 (1959) (original in Finnish with English summary).

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FOR EFFECTIVE REMOVAL OF

Residual Chlorine

Tennessee's Liquid Sulfur Dioxide is a most efficient and economical anti chlor. Removes residual chlorine and other materials which cause color reversion or yellowing with age. It also eliminates excessive residual chlorine in water.

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Automatic Paper Inspection —

- CICO LUMP DETECTOR
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PATENT REVIEWS

MELVIN NORD*

Cleaning an aqueous suspension of pulp

U. S. 2,878,934, issued March 24, 1959, to George H. Tomlinson II and assigned to Howard Smith Paper Mills Ltd., describes an apparatus for cleaning an aqueous suspension of pulp or paper fibers to remove dirt from it by centrifugal action, utilizing a vacuum to remove entrained air.

The separator, shown in Fig. 1, consists of a relatively large-diameter, hollow-truncated cone section 5 of a length considerably greater than its maximum diameter. It is important that cone section 5 be free of internal obstructions likely to impede the uninterrupted flow of the pulp suspension from the larger to the smaller end of the cone. The upper or larger end of cone section 5 is joined to a cylindrical-head section 7 provided with a tangential stock inlet 8, preferably of rectangular-cross section, elongated in the direction of the axis of the unit.

A clean stock-outlet pipe 9 extends below the level of the tangential stock inlet 8 in axial alignment with rejects-discharge aperture 6, situated at the truncated apex of the cone, to provide a stock outlet of greater diameter than the rejects-discharge aperture.

The clean stock is delivered through outlet pipe 9, pipe reducer 15 and elbow 16 to a throttling valve 17 and then, through suitable pipe connections 19, to any suitable point of delivery such, for example, as a flow box from which the stock is passed on to the next process stage.

A pressure gauge 20 is provided immediately ahead of throttling valve 17 and, in the present instance, is shown connected to elbow 16.

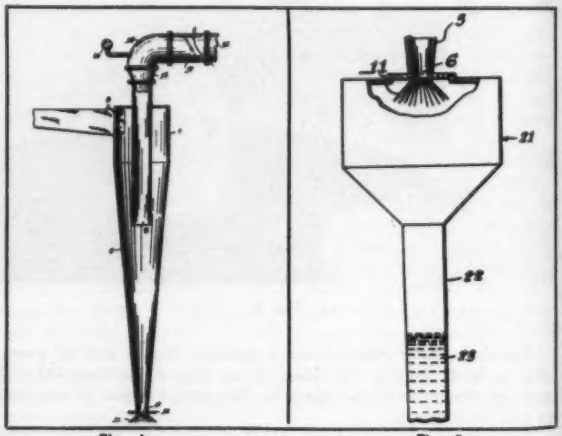


Fig. 1 Fig. 2

The stock entering under pressure at the tangential inlet initiates a swirling motion, the liquid simultaneously spiralling inward and downward at increasing velocity. An up-flowing helical stream, having a maximum diameter equal to that of the accepted stock-outlet pipe develops about the central axis, with a liquid flow transferring from the downward spiral flow to the upward helical flow, which is void of liquid at the axis. It is this central air column which permits the use of a relatively large-diameter rejects outlet.

Solids in suspension in the incoming liquid are subjected to the centrifugal force increasingly developed as the liquid spirals inward and downward thus causing a concentration of solids at the outer shell. Since the centrifugal force tends to drive the solids away from the central axis, it might be expected that they would accumulate in the cylindrical section.

*Patent attorney, 17600 Pinehurst, Detroit 21.

The fact that they carry to the rejects outlet is explained by the fact that they are entrained by the downward fluid spiral in the conical portion of the apparatus, and does not result from a settling towards the rejects outlet by a simple gravity effect, since the unit will also work "upside down." It can be seen from the above that the cone section accelerates the swirl and facilitates removal of the solids.

In Fig. 2, there is shown a vacuum chamber provided by a casing 21 disposed immediately below the dirt discharge opening 6. A drain pipe 22 provides means for continuously withdrawing the solid and liquid components from casing 21. A liquid seal 23 is maintained so that the casing provides a liquid-free space into which the rejects are sprayed as shown at 11 in Figs. 1, and 2.

The liquid-free space is maintained under sub-atmospheric pressures so that suction is created therein which extends along the axis of cone section 5 within the upwardly spiralling stream of clean stock passing to outlet 9. The liquid seal 23 may be maintained by means of a barometric leg from which the rejected stock will drain or by means of a pump fitted with a level control on the suction side.

It has been found that with a vacuum chamber such as described here on a hydrocyclone, the rate of flow through the rejects discharge aperture 6 is greater than when discharged into atmosphere. This results from a decreased diameter of the liquid-free axial core due to its decreased pressure, and the diameter of the aperture 6 can be adjusted to give the desired rate of rejection when operating under these conditions. Entrainment of air with the accepted stock is thus prevented.

Process for bleaching and sizing paper pulp

U. S. 2,878,119, issued March 17, 1959, to Charles R. Outterson, Richard S. Bell and Henry W. Ellerson Jr. and assigned to the Albermarle Paper Mfg. Co., describes a process for bleaching and sizing sulfate paper pulp in such a manner as to eliminate the need for separate bleaching equipment.

The process consists of mixing the sulfate pulp with hypochlorite bleach, allowing sufficient time for the bleaching oxidation and chlorination action of the hypochlorite to become effective, and then adding alum both to release the chlorine remaining in the residual hypochlorite and to set the rosin size. Washing of the bleached pulp as a separate operation can be dispensed with since the aqueous dilution of the pulp, which is required for sheet formation on the paper-making machine, can serve as an adequate wash mechanism.

Treatment of waste sulfite liquor

U. S. 2,872,289, issued February 3, 1959, to Hans O. Samuelson and assigned to Aktiebolaget Rosenblads Patenter, describes a method for the recovery of sulfur values from waste sulfite liquor.

The combustion gases obtained on burning waste sulfite liquor contain sulfur dioxide and a small proportion of sulfur trioxide. An economical recovery of sulfur values from combustion gases is complicated because of their low concentration in the gas (0.4 to 0.8 per cent).

The present invention increases the concentration of sulfur dioxide in the combustion gases. This is accomplished by dividing the combustion gases into two streams—A and B—from which sulfur dioxide is separated, and the sulfur from one of these streams (A) being returned to the furnace and burned with the sulfite liquor. The other gas stream (B) is subjected to a sulfur recovery process for the preparation of the bisulfite solution used in the digestion step.

Teflon suction-box covers

U. S. 2,876,685, issued March 10, 1959, to Robert L. Holmes and assigned to Raybestos-Manhattan Inc., describes an improved suction-box cover for fourdrinier paper making machines, consisting of polytetrafluoroethylene (Teflon).

It has been found that the useful lives of both the fourdrinier screen wire and the suction-box cover are greatly increased by providing the suction-box cover, over its screen-wire contacting side, with a body or sheet of a Teflon surface. Teflon possesses a very low coefficient of friction (about 1/10 that of wood), and its use as the contacting surface for the screen wire results in a greatly reduced wire wear. The life of the suction-box cover equals or exceeds that of conventional covers.

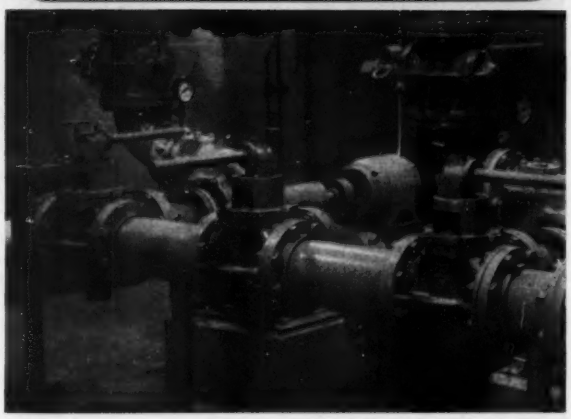
DeZurik Valves—

2-way,

3-way or

4-way—

THE finest PAPER MILL VALVES YOU CAN USE!



In straight-way or multi-port styles, DeZurik Valves give you *exactly* the advantages you want!

They operate easily — every time!

They shut dead tight. They're completely free from constant, expensive maintenance.

And they last longer, too!

Write for details and recommendations.

DeZURIK CORPORATION

SARTELL, MINNESOTA

SAFETY NEWS

First report on 1959 NSC contest

FOR THE FIRST FOUR MONTHS ending April 30, some 267 contestants reported perfect scores in the 1959 Paper Industry Safety Contest sponsored by the National Safety Council. The number of contestants registered in the competition is 637.

Last year's April record showed 258 perfect scores with a total of 591 registered contestants.

The January to April frequency rate for all divisions (except pulpwood logging) was 6.71, a 5-per cent increase from the same period in 1958. In the Pulp & Paper Div. the four month rate was 6.14; a 1-per cent increase from a year ago. In the Paper Converting, a rate of 7.84 meant a 9-per cent increase from last year. Pulpwood Logging reported a rate of 36.18; a 2-per cent increase at the same time in 1958.

Contestants working the most manhours in the January-to-April period without lost-time accidents were: Scott Paper Co. of Chester, Pa.; Crown Zellerbach Canada Ltd., Ocean Falls Division.; and Crossett Paper Mills of Crossett, Ark.

From the eligible mills in Division I the board of judges will choose the mill with the most outstanding record. This plant will be awarded the grand prize—the Edward Benton Fritz Memorial Trophy—during the National Safety Congress in October. The trophy is presented each year by Fritz Publications Inc., publisher of THE PAPER INDUSTRY.

Perfect scores recorded for the January-to-April period were as follows:

Division I—Pulp and Paper Mills

Group A

Scott Paper Co., Chester, Pa.

Group B

Crown Zellerbach Canada Ltd., Ocean Falls; Crossett Paper Mills, Crossett, Ark.; Weyerhaeuser Timber Co. (Kieckhefer-Eddy Div.), Longview, Wash.; Kimberly Clark Corp., Niagara, Wis.; American Can Co. (Marathon Div.), Rothschild, Wis.; Container Corp. of America, Philadelphia, Pa.; Consolidated Paper Corp. Ltd., (Belgo Div.), Shawinigan Falls, Que.; Munising Paper Co., Munising, Mich.; Consolidated Paper Corp. Ltd. (Port Alfred Div.), Port Alfred, Que.; Marinette Paper Co., Marinette, Wis.; Consolidated Paper Corp. Ltd., (Laurentide Div.), Grand Mere, P. Q.; Crown Zellerbach Corp., Port Angeles, Wash.; Mead Corp. (Escanaba Paper Div.), Escanaba, Mich.; Mosinee Paper Mills Co., Mosinee, Wis.; Weyerhaeuser Timber Co. (Everett Pulp Div.), Tacoma, Wash.; Combined Locks Paper Co., Combined Locks, Wis.; Chesapeake Corp. of Virginia, West Point, Va.

Group C

MacMillan & Bloedel Ltd., Nanaimo, B. C.; Bestwall Gypsum Co., Thorold, Ont.; Strathmore Paper Co., West Springfield, Mass.; Container Corp. of America, Chicago, Ill.; Mohawk Paper Mills Inc., Cohoes, N. Y.; Ste. Anne Paper Co., Ltd., Beaupre, Que.; Continental Can Co. (Robert Gair Paper Products Group), Haverhill, Mass.; St. Regis Paper Co., Sartell, Minn.; Falls Paper & Power Co., Oconto Falls, Wis.; International Paper Co., York Haven, Pa.; Kimberly Clark Corp., Fullerton, Calif.; Container Corp. of America, Wabash, Ind.

Group D

Certain-Teed Products Corp., East St. Louis, Ill.; Certain-Teed Products Corp., Savannah, Ga.; Congoleum-Nairn Inc., Cedarhurst, Md.; Columbia Box Board Mills Inc., Chatham, N. Y.; Strathmore Paper Co., Woronoco, Mass.; United States Gypsum Co., Clark Township, N. J.; Mead Corp. (Wheelwright Div.), North Leominister, Mass.; United States Gypsum Co., Oakmont, Pa.; American Can Co. (Marathon Div.), Ashland, Wis.

Hennepin Paper Co., Little Falls, Minn.; Container Corp. of America, Chattanooga, Tenn.; Flintkote Co., Lockport, N. Y.; American Writing Paper Corp. (Linden Div.), Holyoke, Mass.; Crown Zellerbach Corp., Lebanon, Ore.; Container Corp. of America, Circleville, Ohio; Celotex Corp., Los Angeles; New York & Pennsylvania Co. Inc., Willsboro, N. Y.; Crown Zellerbach Corp. (Gaylord Container Corp. Div.), Baltimore, Md.; Strathmore Paper Co., Woronoco, Mass.; Bestwall Gypsum Co., Pryor, Okla.; Container Corp. of America, Noblesville, Ind.

Group E

Johns-Manville Co. Ltd., Asbestos, Que.; Coos Bay Pulp Corp., Empire, Ore.; Fibreboard Paper Products Corp., Sumner, Wash.; Columbia Box Board Mills Inc., Wallomsac, New York; St. Regis Container Corp. (Muskingum Mill Div.), Coshocton, Ohio; National Gypsum Co., Garwood, N. J.; United States Gypsum Co., Kansas City, Mo.; American Writing Paper Corp. (Albion Div.), Holyoke, Mass.; Forest Fiber Products Co., Forest Grove, Ore.; National Gypsum Co., Anniston, Ala.; St. Regis Paper Co., Herrings, N. Y.; United States Gypsum Co., Oakmont, Pa.; Robertson Paper Box Co. Inc.; Montville, Conn.

Continental Can Co. Inc. (Robert Gair Div.), Middleton, Ohio; National Gypsum Co., Pryor, Okla.; Rogers Corp., Rogers, Conn.; Pollock Paper Corp., Columbus, Ohio; Flintkote Co., Little Ferry, N. J.; Spruce Falls Power & Paper Co. Ltd., Kapuskasing, Ont.; United States Gypsum Co., Gypsum, Ohio; Container Corp. of America, Wilmington, Del.; Riegel Paper Corp. (Hughsville Plant), Reigelsville, N. J.; Celotex Corp., Avery, Ohio; Crown Zellerbach Corp. (Gaylord Container Div.), Dresden, Ohio; Banner Fibreboard Co., Wellsburg, West Va.; National Gypsum Co., Newburgh, N.Y.; Johns-Manville Corp., Tilton, N. H.

Rogers Corp., Manchester, Conn.;

(Continued on page 352)

NEW PRODUCTS

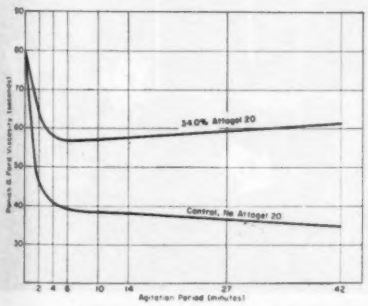
These items are numbered for your convenience. Further information on the various products described may be requested at no obligation through our Readers' Service Dept. Use the business reply card in this issue.

Automatic metering pump

The latest model to the McCannameter line of metering pumps has been introduced. This compact and packless pneumatic-stroke controlled McCannameter automatically proportions chemicals to any main-line flow.

Using its pneumatic stroke-controlled instrumentation, the pump maintains a constant discharge in proportion to the main-line flow. Operating on a 3- to 15-psig. air signal, the versatile instrument requires no additional power source of air, responds instantaneously to eliminate backflash and keep the chemical-discharge-to-flow ratio precisely accurate. *Hills-McCanna Co.*

Circle No. 11 on Readers' Service Card



Gelling additive

The availability of a new gelling additive, called Attagel 20, has been announced. Now, corrugated box manufacturers are reportedly getting more mileage out of tapioca starch adhesives through the use of this additive, a new colloidal grade of processed attapulgite.

The above graph shows the results of laboratory investigations and illustrates the stabilizing effects of Attagel 20 on the viscosity breakdown of a typical tapioca corrugating paste. These test conclusions have been confirmed by a number of plants where the material is being used in corrugated production.

In this laboratory evaluation, high shear equipment was used to accelerate viscosity breakdown. The amount of Attagel 20 added is not necessarily indicative of commercial applications. *Minerals & Chemicals Corp. of America.*

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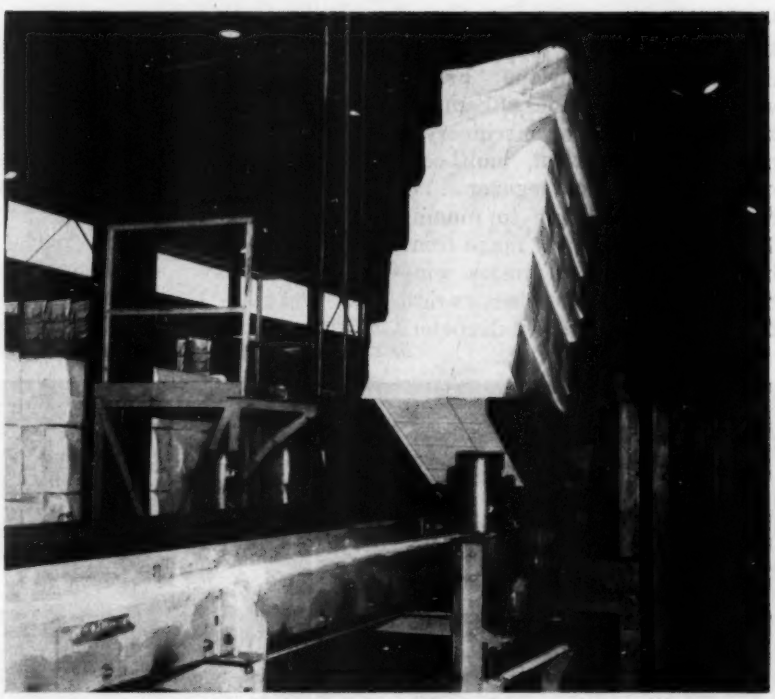


Automatic stacking units

A simple and unique stacking procedure employing two upenders in tandem is revealed.

The first upender receives loads, one at a time, and stands them up on the second upender. After five loads have been collected, the second upender sets these loads up, stacked five high. The stack can be delivered to a conveyor as shown in the photo or can be picked up by an industrial truck. A system of electric eyes controls the units.

According to the company, these units will handle almost any load that can stand on end. The loads shown in the photo are too soft and irregular to be handled with clamps. *Lamson Corp.*

Circle No. 13 on Readers' Service Card

Plastic valves and strainers

The addition of three sizes—¼, ⅜ and 1¼ in. — to the company's rigid PVC Y-globe valves, check valves and strainers is announced. The company can now offer these products in a complete range of sizes from ¼ to 2 in.

These products are said to offer exceptional resistance to inorganic salts, alkalis, acids and other corrosive fluids used in the chemical, pulp and paper and allied industries. These plastic Y-globe valves, check valves and strainers operate successfully at pressures to 150 psi. at 75° F. The 3-in. size will be available soon. *Walworth Co.*

Circle No. 14 on Readers' Service Card

Felt washing compound

A new felt washing compound, trade named Atlasene 500, is now on the market. Having high detergency and outstanding emulsifying properties, it reportedly can be used under all felt-cleaning conditions for removing dirt particles, rosin, carbonates, etc.

Whether the felt is washed on the machine loose or roped, or removed from the machine, the new washing compound can do a thorough cleaning job, claims the company. Atlasene is designed to loosen foreign matter, emulsify it and carry it away from

. . . Fluid Power news

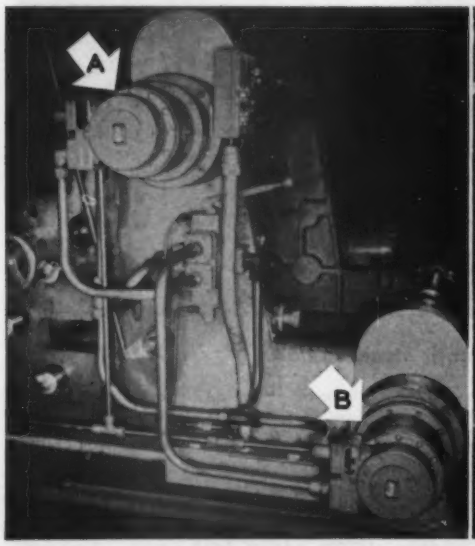
REPORT
No. 12,300
HIGH
PERFORMANCE
WINDER
DRIVES

From Oilgear Application-Engineering Files

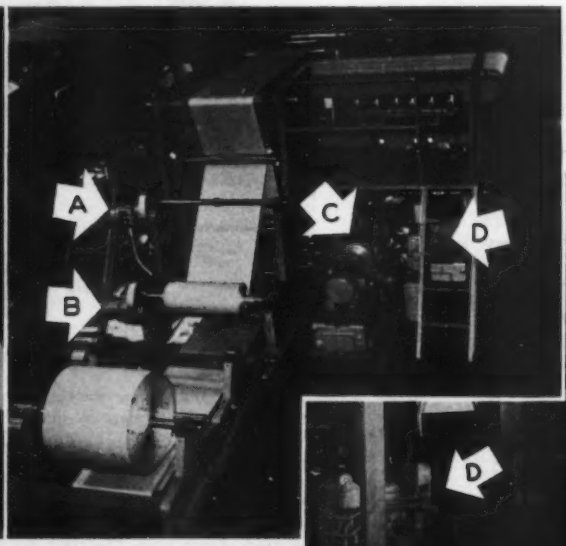
HOW OILGEAR PROGRESSIVE ENGINEERING PACES IMPROVEMENTS ON "BEMIS" MACHINES

CUSTOMER: *Bemis Bro. Bag Company, St. Louis, Missouri*

DATA: To efficiently produce the wide scope of paper, cloth, and polyethylene "Flexible Packaging" for which they are famous, "Bemis" designs and builds their own production machinery. Basically, "Bemis" machines are roll-fed, multi-color printing presses capable of very close register . . . operating from inching speeds of 15 fpm to running speeds of 400 to 1000 fpm. Press runs range from 1000 to 1,000,000 bags. Being roll-fed presses, winder drives and controls were a major problem, as ratios of 5:1 up to 10:1 from core to finished roll diameter are not uncommon. Paper widths vary from 10" to 56", with roll weights from 1000 to 2000 lb. "Bemis" specified that their winder drives must be compact; easy for shop, maintenance, and operator personnel to adjust, maintain, and understand. All electrical controls must be simple, with standard components preferred. Each machine to have one main control panel, and three or four remote, push-button panels — with some constant indication of load and tension as a desirable feature. Long, trouble and maintenance-free life was also of prime importance along with ease in installation.



Close-up of face-mounted, Oilgear Type "H" Fluid Power Motors (A, B), geared to rewind spindles of newest "Bemis" machine, shown center. Oilgear Type "D" Pump on "Power-Pak" (C) — center photo — supplies Fluid Power for rewind drive.



Newest "Bemis" press during "trial runs" prior to installation. Rewind motors (A, B) to left. Two Oilgear "Power-Paks" (C, D) with Oilgear Type "D" Pumps and Controls can be seen "tucked away" under the dryer section.

View "around-back" of new "Bemis" press dryer section, showing Oilgear Type "D" Pump and Controls on "Power-Pak" (D) which supplies Fluid Power to Oilgear Type "H" Motor (E) for main press drive. See "Note" below on Oilgear Pump (F), direct-coupled to tail-shaft of Motor (E).

SOLUTION: Through a program of constant improvement and engineering teamwork, Oilgear *Fluid Power* Drive and Control Systems have so successfully paced requirements for more efficient production equipment that "Bemis" plants in 16 cities now have 48 machines equipped with Oilgear winder drives. Dancer roll controls are used on 39 . . . 9 more recent installations have "*HYTAC SYSTEM" drives. Two newest machines (one shown above) have Oilgear Type "D" electrohydraulic servo controlled main press drives, and hydraulic servo controlled winder drives. One reason for this ever-increasing use of Oilgear "Any-Speed" drives has been clearly stated as follows: *"We put them in and forget about them . . . some have been operating for over 11 years without service or repair — many loaded to maximum capacity — others have had no oil change in five years"* . . . proof of the statement heard in all industry — *"For the lowest cost per year — it's Oilgear!"* One "Bemis" installation using a HYTAC SYSTEM winder drive handles 40 to 70-lb kraft stock 26" to 63" wide. This winder operates over a 13:1 ratio — from 3¼" diam. cores to 43½" diam. rolls — is limited only by interference on the machine. Of this HYTAC SYSTEM, "Bemis" states — *"Other types of variable speed drives*

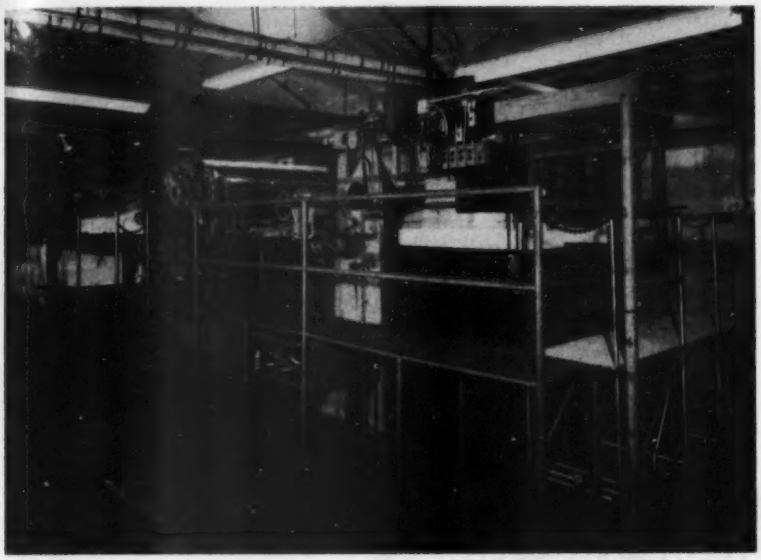
NOTE: *An unusual installation feature is partially visible on photo above. Oilgear Type "H" Fluid Power main press drive motor (E) is also direct-coupled to Oilgear Type "H" Pump (F) which supplies Fluid Power to an Oilgear Type "H" Motor — not shown — that drives the dryer fan.*

USER REPORTS — *" . . . exceptionally fine acceleration control . . . smooth creeping and inching speed up to maximum . . . exceptionally smooth running speed . . . are easier to adjust than other drives . . . require less space . . . pressure gage shows load while drive is in operation . . . maintain an adjustable tension from constant tension to constant torque."* "Bemis" — like other users — has found that Oilgear Drive and Control Systems give them constant tension, automatic tapering tension, stall tension, constant torque, automatic tapering torque, or a combination of tension and torque characteristics to meet their every production requirement.

For practical solutions to YOUR linear or rotary Controlled Motion problem, call the factory-trained Oilgear Application-Engineer in your vicinity. Or write, stating your specific requirements, directly to . . .

THE OILGEAR COMPANY

Application-Engineered Controlled Motion Systems



85" wide
High Speed
Sheeting Unit
handling
High Grade
Filter Papers
for
The
Eaton-Dikeman
Company
at
Mt. Holly Springs,
Pennsylvania

Unit Supplied By

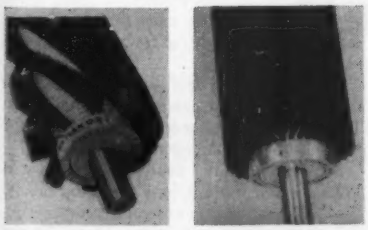
Maxson Automatic Machinery Company
98 Granite St., Westerly, R.I.
Specialists in solving sheet problems since 1912

New Products . . .

the felt in the rinse water. It is said to be used extensively by weavers of fine woolens and worsteds in their most exacting scouring operations.

Atlasene 500 is easy to store because freezing does not impair its efficiency and no storing precautions are necessary. *Atlas Refinery Inc.*

Circle No. 15 on Readers' Service Card



Conveyor-belt cleaning brushes

The production of two new Metlkor brushes—spiral or rotary—for the automatic removal of chemicals, metals, coal, wood or plastics from fabric, metal or rubber conveyor belts and adjacent operating equipment has been announced. Available for intermittent or continuous duty, they feature easy installation and adaptability to any system, according to the company.

The bristles are made of Du Pont Tynex Nylor or other materials, depending on their use. They are designed for uniform, perfect pressure and are resistant to the corrosive effects of acids, alkalies, etc. The cores of the brushes are made of aluminum or steel. *M. W. Jenkins' Sons Inc.*

Circle No. 16 on Readers' Service Card

Solid copolymer

A new vinylpyrrolidone/vinyl acetate copolymer is now being produced in solid form. It is the newest member of the PVP/VA copolymer series which has been marketed in 50 per cent alcoholic solutions.

Known as PVP/VA S-630, the new copolymer is designed for use wherever it is necessary or desirable to avoid alcohol. It offers special advantages to manufacturers of paper coatings, flexible finishes and protective coatings. *Antara Chemicals, Sales Division of General Aniline & Film Corp.*

Circle No. 17 on Readers' Service Card

Power strapping machine

The availability of a new economical, semi-automatic or fully automatic, operatorless power-strapping machine is announced.

The machine has a strap-size range from $\frac{3}{8} \times .010$ in. to $\frac{3}{4} \times .035$ in. and a strap feeding and strapping speed of 196 fpm. It can be mounted in any position and the straps may be applied in either a vertical or horizontal plane.

No limitations exist on the shape, size or firmness of the bundles and packages that may be wrapped. There are also no limitations on the placement of the seal with respect to the bundle. The bundle has a minimum face dimension of approximately 1 in.

Several machines may be used together so that multiple straps may be applied automatically and simultaneously to a single package. *Signode Steel Strapping Co.*

Circle No. 18 on Readers' Service Card

Refining machine

A newly designed, continuous refiner for pulp mill defibering and paper mill refining is being offered. Known as the Emerson Claflin 303, it is said to be the first conical refiner having oil-mist lubrication.

It is equipped with two mist-atmosphere lubrication devices located in the bearing pedestals. Each operates independently, supplying oil mist to each bearing. Visible oil-supply and pressure gauges are built into the housing. Also a visible or audible warning system is provided for protecting the bearings.

The Claflin 303 is ruggedly constructed to withstand 100 psi. An accurate microfeed mechanism controls the plug position to permit positive settings and

New Products . . .

extremely fine adjustments. *Emerson Mfg. Co., John W. Bolton & Sons Inc.*

Circle No. 19 on Readers' Service Card

Rotogravure press

A completely new Cerutti rotogavure press, Model 14-R Rotopackager, is announced. This standard-duty press prints on cellophane, foil and paper at high speeds.

Offering a wide variety of custom-tailored features, the converter is given more than 12 different options for selecting the type of side- and length-register controls, tension and impression controls, rewinds and unwinds, dryers, printing units, doctor blades, etc., as well as a complete line of auxiliary equipment.

The Rotopackager is made in six web width from 24 to 42 in., all with a repeat range from 14 to 30 in. It is available with any number of color units desired. *Parsons & Whittemore Graphic Corp.*

Circle No. 20 on Readers' Service Card

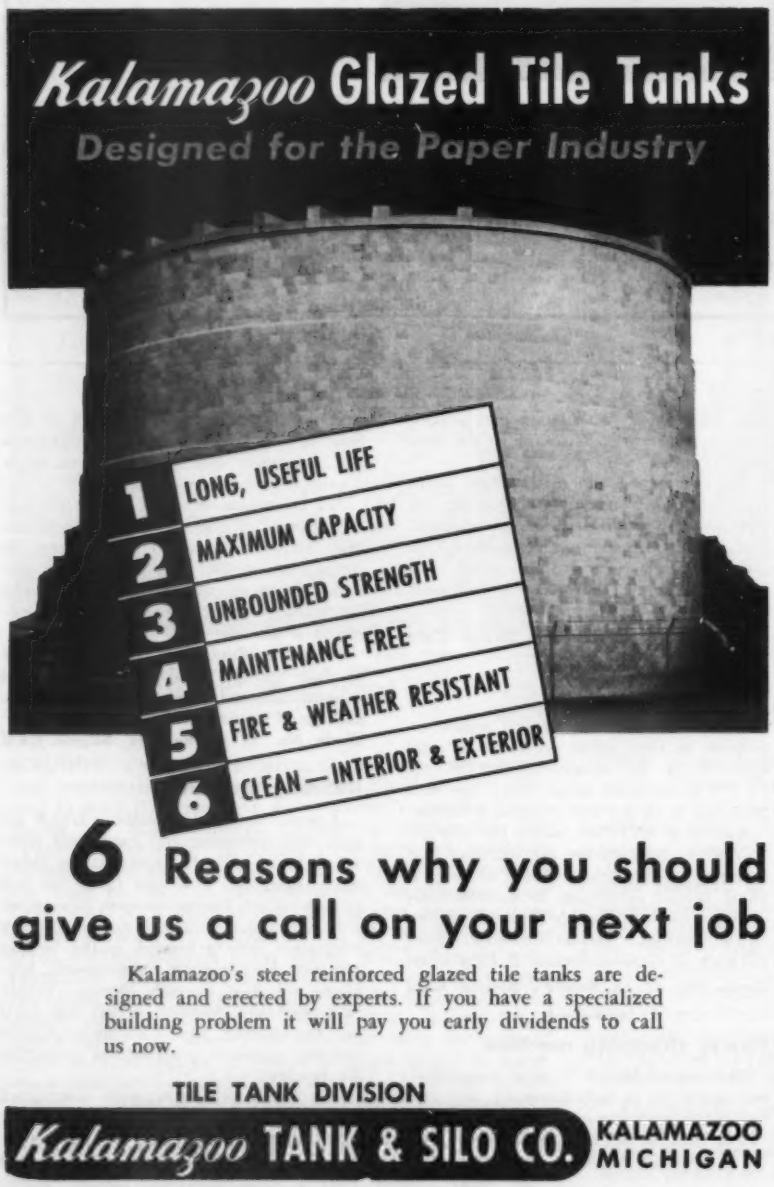
Log barker

A new mobile log barker has been developed. Adaptable to a wide variety of woods and conditions, this completely self-contained machine requires no external power sources.

The log barker produces from 5 to 8 cords per hour, depending on conditions. It is effective with logs, 4 to 16 in. in diameter and 4 to 6 ft. in length. Longer lengths can be handled with auxiliary in-feed roller supports.

The barking component has replaceable tool tips and adjustable tool-arm pressures. *Canadian Ingersoll-Rand Co.*

Circle No. 21 on Readers' Service Card



6 Reasons why you should give us a call on your next job

Kalamazoo's steel reinforced glazed tile tanks are designed and erected by experts. If you have a specialized building problem it will pay you early dividends to call us now.

TILE TANK DIVISION

Kalamazoo TANK & SILO CO. KALAMAZOO MICHIGAN

Electronic weight detector

A new electronic weight detector for use with dial scales is announced. It is designed to provide the bridge between manually controlled and truly automatic weighing processes. Previous to the introduction of this instrument, the only method of determining when a scale had reached its true or final weight was by visual observation, according to the company.

Now, the new electronic weight detector definitely determines that the correct weight has been reached before allowing the weight to be recorded; allowing read-out equipment to be operated; allowing controls for conveyors, hoppers, mixers and other machinery to be operated; thereby assuring correct weighing without visual observation. *Fairbanks, Morse & Co.*

Circle No. 22 on Readers' Service Card

Auxiliary actuators

Two new auxiliary actuators, designed for use with the company's recently introduced switch, have been announced. Manufactured of corrosion-resistant steel, these actuators absorb the side thrust which a cam or slide might exert on the switch plunger.

The JX-40 is a leaf actuator, used with low-angle or slow-moving cams or slides. The JX-45 is a roller-leaf actuator used for rapid cam or slide operation.

Sub-subminiature switches (designated ISXI-T) and the auxiliary actuators can be used on computers, miniature recording devices and other applications where weight and space are at a premium. *Micro Switch Div., Minneapolis-Honeywell Regulator Co.*

Circle No. 23 on Readers' Service Card

Homopolymer emulsion

A new fine-particle, polyvinyl-acetate homopolymer emulsion is being marketed.

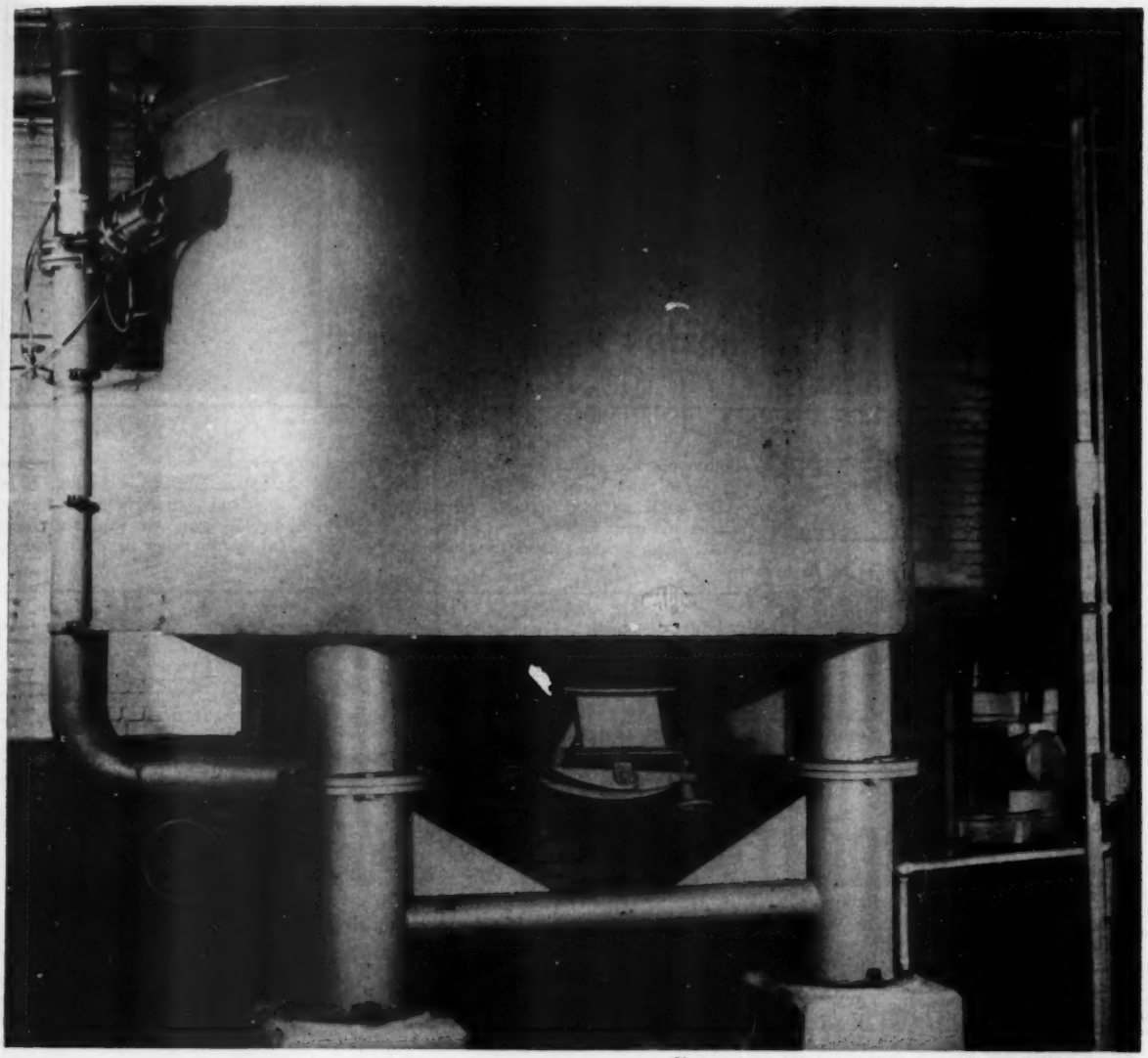


Photo courtesy Waterfalls Tissue Corp., Mechanic Falls, Maine

NEW SOLVO PULPER
AT WATERFALLS TISSUE CORPORATION
PULPING LEDGER STOCK

QUALITY — SPOT FREE
CONSISTENCY — 6.5% B. D.
TIME — FIFTEEN MINUTES

SIMILAR PERFORMANCES ARE OBTAINED ON WET STRENGTH TISSUE BROKE, HARD WHITE SHAVINGS AND TABULATING CARDS

IMPROVED MACHINERY INC.
NASHUA, NEW HAMPSHIRE

In Canada, Sherbrooke Machineries Ltd., Sherbrooke, Quebec

STOP TELESCOPING ROLLS • MUSHROOMING CORES

Use HORTON Clutches and Brakes to control the sheet tension on your center winders and back stands. Take the guess work out of tensioning and let Horton equipment give you uniform good rolls all the time.

VARIABLE SPEED CLUTCH PULLEYS
GOVERNOR CONTROLLED BRAKES

HORTON MFG. CO., INC.
MINNEAPOLIS 14, MINNESOTA

New Products . . .

Called GELVATS-85, it is said to have excellent mechanical stability, good blocking resistance and freeze-thaw stability. It is highly stable on dilution.

Films cast from this emulsion have outstanding gloss and clarity and possess very good resistance to water, grease and oils. This emulsion is recommended for use in paper coatings, adhesives and surface coatings. *Shawinigan Resins Corp.*

Circle No. 24 on Readers' Service Card

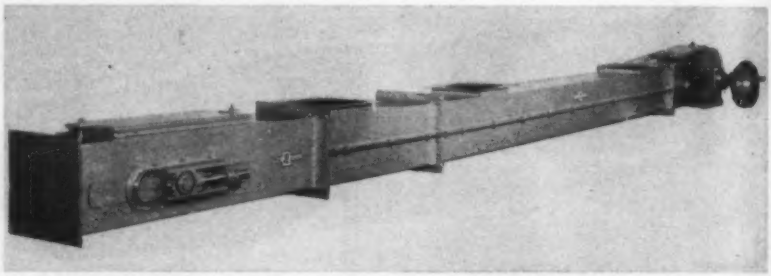
Tubing

A new type of flexible, light-weight pneumatic and hydraulic tubing is now available for use in the OEM and for maintenance-replacement of conventional tubing and rubber hose.

Known as Synflex-N3, the tubing is a natural color polyamide formulation for permanent use in lubrication systems, instrumentation, vacuum, chemical and effluent lines and air lines to equipment, tools, etc.

Two basic types of Synflex-N3 tubing are offered: Group I low-pressure tubing for applications to 1500 psi., and Group II for medium-pressure service to 2500 psi. Both types are available with ⅛-, 3/16-, ¼-, 5/16-, and ⅜-in. O.D. Wall thickness varies with intended service, outside diameter and other factors.

According to the manufacturer, the new tubing possesses many desirable features over conventional tubing in addition to its lower cost and extremely light weight. These include precision tolerance, lower notch sensitivity, greater flexibility and re-



Self-cleaning drag conveyor

The development of a new self-cleaning, chain drag conveyor for handling various dry chemicals, wood chips, sawdust, etc. has been announced. The conveyor carries materials by means of drag blades mounted on specially hardened roller chains that continuously move over a smooth steel slide. A built-in return circuit prevents overloading and eliminates the danger of choke-up.

According to the company, the major advantage of this conveyor is that it provides for positive self-cleaning while it uses multiple inlets and discharges. Material from the top inlets is conveyed to the end of the top slide where it falls through the chain and is picked up by the drag operating on the bottom slide. Any material not discharging through the outlets provided, travels around the end and is returned to the top strand or slide to mingle with additional incoming material. *Sprout, Waldron & Co., Inc.*

Circle No. 25 on Readers' Service Card

ENGLISH CLAYS AMERICAN

UNIFORM • SUPERIOR • DEPENDABLE

English China Clays Sales Corporation
6 East 45th Street, New York 17, N.Y.

Get out the dirt... *she doesn't see!*

D-I LESTOIL LIQUID DETERGENT

No matter what grade of raw stock you use... no matter what care you take in sorting... there's always the danger that grease, oil, wax and other contaminants will get by — to create specs or shiners or otherwise blemish your finished sheet.

Today... increasing numbers of smart mill operators insure against these costly headaches by adding D-I LESTOIL when cooking rags.

D-I LESTOIL speeds up wet-out, assures uniform packing and cooking in the boiler; thoroughly penetrates every fiber. It emulsifies and disperses grease, graphite, wax... all dirt. Produces fibers free of soil, fibers that bleach readily and absorb dye uniformly.

D-I LESTOIL guards against redeposition of soil ... permits complete, free rinsing.

End result? Clean, bright sheets of uniform color and quality.

FREE!

A generous sample and complete details on how to get better quality paper with d-i LESTOIL!

MAIL THIS COUPON TODAY!

LESTOIL, INC.
A subsidiary of Adell Chemical Co.

LESTOIL, INC. 98 Garfield Street
HOLYOKE, MASS.

Please send me a free sample of d-i LESTOIL and complete directions for use.

NAME _____ **TITLE** _____

FIRM _____

ADDRESS _____

CITY _____ **STATE** _____

New Products . . .

sistance to internal or external abrasion. Normal maximum operating temperature is 150°F. *Synflex Products Div., Samuel Moore & Co.*

Circle No. 26 on Readers' Service Card

Automatic metering pump

A new combination piston-diaphragm, automatic metering pump that adjusts the pumping rate from zero to full capacity by signals from pneumatic instruments, is available in a variety of models—all of the positive displacement type.

Trade-named Auto-Pneumatic Micro-flo Pulsafeeder, it provides the processing industries with a method of automatically metering chemicals without using constant level controls, high head tanks or stuffing box pumps. The metering pump is explosion-proof and designed for continuous heavy-duty service. *Process Equipment Div., Lapp Insulator Co. Inc.*

Circle No. 27 on Readers' Service Card

Control valve

A new control valve, now available, can be used with air, oil, gas, water or other fluids. Called Colorflow, it is said to be unique in that the adjusting scale is composed of permanently easy-to-read color graduations.

The color-coded feature is expected to simplify many basic control problems, whether on a single machine or in an entire plant. Even untrained personnel can check the valve setting at a glance, make quick adjustments, record the reading and reset the valve when necessary.

Colorflow valves are available in five standard sizes—⅛, ¼, ⅜, ½, and ¾ in., and can withstand pressures up to 5000 psi. Other sizes are available on special order. All internal and moving parts are constructed of stainless steel. Valve bodies are available in brass, carbon steel or stainless steel. *Manatrol Corp.*

Circle No. 28 on Readers' Service Card

Plastisol-lined pipe fittings

A complete line of Plastisol (PVC)-lined pipe fittings, in malleable iron or aluminum, is in production. They are supplied with grooved ends for quick-jointing pipe with Victaulic mechanical couplings.

The new Plastisol-lined fittings are available in elbows, tees, reducing tees, reducers, caps and adapter nipples in sizes from 1¼-in. through 12-in. diameters.

Plastisol lining is essentially a plastic rubber applied by dipping. The lining is seamless, of uniform ⅛-in. thickness and securely bonded to the interior and ends of the fittings.

The fittings are suited for handling slurries and abrasive solids at pressures to 1000 psi. They are also resistant to numerous acids, alkalies, salts, plating-solutions and organic and miscellaneous reagents. *Victaulic Co. of America.*

Circle No. 29 on Readers' Service Card

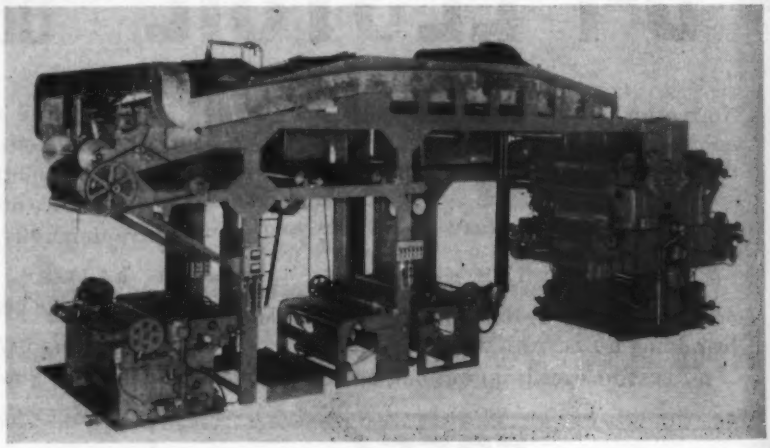
Circular-spray nozzle

A new extra-wide angle, circular-spray nozzle has been developed for spraying or washing the inside of tubular units.

Called the Span-Jet, it comes in two styles to provide either a 180° flat, circular spray pattern or a 160° hollow-cone spray pattern. The nozzles are made in capacities from .75 to 10 gpm. at 40 lbs. psi. of pressure. The standard Span-Jet nozzles are made with a male connection to fit pipe sizes of ⅛, ¼ and ⅜ in. They are available in brass, 303 stainless steel or special materials as required.

The nozzle can also be applied to air washers, roof-cooling systems, various chemical processes and many other uses where extraordinary wide-angle sprays are required. *Wm. Steinen Mfg. Co.*

Circle No. 30 on Readers' Service Card



Six-color flexographic press

A new six-color flexographic press, known as Model 2641, has been introduced. According to the manufacturer, it is heavily built to assure the rigidity necessary for complete accuracy at today's high speeds.

Model 2641 has a new (patent pending) impression control based on a hydraulic cylinder connecting the ink-section frames and actuating the impression release. When the impression is "on" there is no "play" in the system, and it absolutely relocates accurately when switched on and off.

The fountain rolls can be operated at slower adjustable speeds than the transfer and impression cylinders to eliminate the splashing that results when all three run at high speeds. The variable-differential drive eliminates the need for excessive pressure settings of the fountain roll that causes roll deflection. This provides uniform transfer to plates across the press for uniform high quality.

Auxiliary equipment is mounted on a platform to permit the storage of ink and paper beneath it. Wiring is complete on the press to save installation time and cost. *Paper Converting Machine Co.*

Circle No. 31 on Readers' Service Card

NEW LITERATURE

Books

GLOSSARY OF PACKAGING TERMS (2nd edition). Edited by Dr. L. V. Burton. Published by Packaging Institute Inc., 342 Madison Ave., New York 17. Pages: 323. Price: $3.00 (originally selling for $6.75).

This new hard-covered, edition contains three times as many terms as the first edition. It is now accepted and used in the U. S. Government Interim Standard No. 0075, Business and Defense Service Administration, U. S. Dept. of Commerce.

The new glossary is said to be the only publication of its type to serve the entire $10 billion packaging industry. According to the publishers, every effort has been made to assure the accuracy of definitions by checking with acknowledged authorities in specific areas of packaging.

The special price offer is the result of the Packaging Institute's recent move to new quarters, and the consolidation of its extensive stock of technical publications on all phases of packaging.

PACKAGING RESEARCH: AN INVENTORY. Written by Spencer A. Larsen. Published by American Management Association Inc., 1515 Broadway, Times Square, New York 36. Pages: 207. Price: $6.00.

Prepared under the auspicies of the Packaging Advisory Committee, this book provides a comprehensive and classified inventory of literature pertaining to packaging research. Current packaging research trends, based on new materials and methods, are discussed and principal sources of packaging information — periodicals, directories, manuals, etc.—are listed.

This book includes a survey of the packaging research and the needs and goals of packagers and suppliers. Special requirements of various industrial groups are also given.

Booklets

SIMPLIFIED PRACTICE RECOMMENDATION FOR BOXBOARD THICKNESS R44-59 is the title of the revised third edition, recently made available by the Superintendent of Documents. This revision was requested by the National Paperboard Association and became effective for new production on May 28, 1959, after being voluntarily accepted by producers, distributors, users and other interests. It covers changes in caliper and weights of board, as well as additional calipers of board and changes in descriptions of products. The revision also eliminates one gage list. Copies of R44-59 may be obtained from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Price 10c each.

TIMBER MARKET REVIEW is the title of Supplement 8 to Volume XI of The Timber Bulletin For Europe. Issued jointly by the United Nations' Economic Commission for Europe and the Food & Agriculture Organization. This supplement covers the timber market in Norway from 1958 to the end of February 1959. It discusses the general timber market situation, fellings, production of forest industries, consumption and stocks, prices, exports and imports. Eight tables of appropriate data are also given. Copies of the Timber Market Review may be obtained by writing to FAO, United Nations. Price 15c each.

USDA Reports

STATION PAPERS available from the Lake States Forest Experiment Station. Station Paper No. 69 discusses snow behavior in forests of northern Minnesota and its management implications; Station Paper No. 70 discusses the forest insect and disease situation; and Station Paper No. 71 discusses the growth of swamp conifers following an improvement cut. All of these studies are available by writing to M. B. Dickerman, Director, Lake States Forest Experiment Station, U. S. Dept. of Agriculture, St. Paul 1, Minn.

Manufacturers' Publications

These items are numbered for your convenience. Copies of the publications may be requested at no obligation through our Readers' Service Dept. Use the handy business reply card which accompanies this issue.

Control equipment

Conoflow Corp. has issued a new 16-page booklet titled, Application of Conoflow Equipment in Modern Pulp and Paper Making Processes, and designated as Technical Bulletin MD-1. It contains data on the application of control valves, pulp stock valves, Saunders valves, butterfly valves, pressure and liquid level transmitters, etc., in the pulp and paper making processes. A number of major processes are shown in diagramatic form, including sulfite acid preparation, brown stock washing, black liquor evaporation and stock proportioning.

Circle No. 32 on Readers' Service Card

Correct knife sharpening

Simonds-Worden-White Co. has issued a new wall chart which describes and illustrates the correct methods for sharpening paper- and veneer-cutting knives. The step-by-step proce-

A New Filling Combination that will SAVE YOU $$$ IN YOUR MILL

E. D. Jones Adapta-Plug

and FULBAR SHELL FILLINGS

Adapta-Plug - a revolutionary advance, this is strongest plug design developed; completely bandless; easiest to strip and fill. Patented.

Fulbar Shell Fillings - rigid, one-piece, with no keys or wedges, saves hours of installation time. Famous Nowave design. Made to fit shell of any Jordan.

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BUILDERS OF QUALITY STOCK PREPARATION MACHINERY

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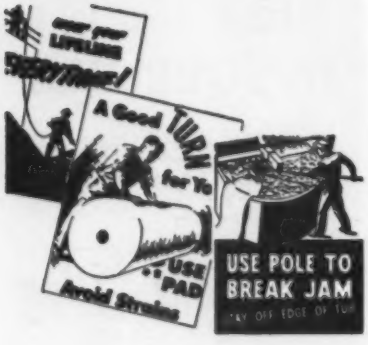
POSTERS — A POTENT SAFETY TOOL



Posters should be one of the top aids in your safety program. No other safety medium can reach your entire audience—not once, but many times each day—with such low-cost safety messages. They are directed at the worker acts and worker attitudes that lead to accidents. Posters lend *timeliness, repetition and continuity* to your safety program . . . the three fundamental principles of direct selling.

The National Safety Council maintains a stock of posters that covers all industries, operations and phases of safety and health. These posters are produced in two sizes: "A" size, 8½"x 11½", and "B" size, 17x23". Their colorful illustrations and eye-catching captions make them ideal for the mass selling of safety.

Write for a free copy of the Directory of Occupational Safety Posters. This 72 page catalog illustrates 744 posters, indexed and classified for specific operations.

NATIONAL SAFETY COUNCIL
425 N. Michigan Ave.
Chicago 11, Illinois

New Literature . . .

dures for both grinding and honing are discussed in the four-page, two-color chart. Also included are recommended cutting angles for paper stocks, rubber, veneer and many other materials. On the back of the chart is a handy knife-check list to help compile inventory and specification data on knives and cutting equipment.

Circle No. 33 on Readers' Service Card

Flotation-type saveall

Krofta Engineering Corp. has recently published a new four-page bulletin which fully describes its new flotation-type saveall, trade named Krofta Flotator. The bulletin includes a photo and a detailed diagram, as well as two tables giving test results and sizes. The Krofta consistency regulator and Krofta metering pump are also briefly mentioned.

Circle No. 34 on Readers' Service Card

Wood equipment

Arrow Tank Co. Inc. has issued a new two-page brochure on wood equipment for the paper and pulp mill industries. It discusses such items as its wooden storage tanks, wood pipe, lumber parts, wood stacks and fittings, blow pits and decay-resistant wood dowels. The company's line of hardware is also listed.

Circle No. 35 on Readers' Service Card

Lump detector

Waldorf Industrial Controls Div. of F. C. Huyck & Sons has recently issued a comprehensive technical bulletin on its CICO lump detector. The bulletin covers the operation of the detector and outlines its applications in the paper industry. Also included is a page on roll-specification data and four diagrams.

Circle No. 36 on Readers' Service Card

"Setting the bow"

Mount Hope Machinery Co., through its second in a series of technical bulletins, tells papermakers the various ways of "setting the bow" on its roll for laterally expanding or contracting the web, and for correcting slack edges or baggy centers. This bulletin also covers other production problems such as dryers, wraps and bows, size presses, calenders, slitters and cutters.

Circle No. 37 on Readers' Service Card

Sodium bisulfite

Monsanto Chemical Co. has issued a free pocket-size folder entitled, Use Guide for Sodium Bilsulfite. Designed especially for jobber salesmen, it serves as a quick reference to users of the chemical in the paper, textile, chemical and other industries. The folder also carries a handy reference chart on weights of 24 widely used industrial chemicals.

Circle No. 38 on Readers' Service Card

Reprints

INFILCO Inc. announces that reprints of two papers, presented at recent conferences, are now available. Reprint 90, which was passed out at the Empire State Metropolitan District TAPPI meeting in Sept. 1957, reviews the various ways of treating waste water from pulp and paper mills. Operating data on an activated sludge pilot plant installation at a board mill using waste paper furnish is also included. Reprint 91, which was presented at the Maryland-Delaware Water and Sewage Association Conference, covers air flotation for removing suspended solids from white water. Operational data are also presented.

Circle No. 39 on Readers' Service Card

Protective coatings

Carboline Co. has released Bulletin 100, a four-page, completely revised bulletin on protective coatings. A break down of four classes of corrosive conditions according to severity of exposure is given. Sketches of appropriate areas are shown in each grouping. A simplified chart enables coatings to be selected according to service requirements. Physical properties as well as chemical resistances are shown in easy-to-read columns. Examples of typical recommendations serve as a guide for understanding generic types and standard products.

Circle No. 40 on Readers' Service Card

Chain system

Allis-Chalmers Mfg. Co. has released a leaflet describing its new economical Spira Loop chain system that reduces operating and maintenance costs in wet process cement kilns, lime sludge kilns and wash mills. The new chain design is said to provide more heat transfer per link.

Circle No. 41 on Readers' Service Card

Conveyors

M-H Standard Corp.'s new bulletin describing its unitized all-metal conveyor, tradenamed Armorbelt, is now available. The new conveyor comes in steel, aluminum or stainless steel models. The bulletin mentions Armorbelt's engineering data, specifications and on-the-job features.

Circle No. 42 on Readers' Service Card

Horizontal mixers

Young Machinery Co. Inc. has issued a bulletin announcing its completely new line of horizontal mixers. The new 12-page bulletin gives complete dimensions for mixers up to 500 cu. ft. working capacity and illustrates various arrangements of ends, supports, agitators, shafts, glands, covers, inlets and discharges, gates and drives. A check list is also included for insuring proper selection of desired mixer components.

Circle No. 43 on Readers' Service Card

Diatomite mineral fillers

Great Lakes Carbon Corp., Mining and Mineral Products Div., announces that its Dicalite Technical Bulletin E41 provides a basic study of the characteristics and applications of Dicalite diatomite minerals fillers. The 12-page bulletin also includes information on its application in paperboard, paper and paper products. Bulletin F-52 gives more detailed information on its application in paperboard, paper and paper products.

Circle No. 44 on Readers' Service Card

Paper coatings booklet

Rohm & Haas Co. announces the availability of its newly revised 16-page illustrated booklet, Rhoplex Acrylic Emulsions in Paper Coatings. This booklet has ample graphic and tabular data on the acrylic emulsions. It gives details on the characteristics of emulsions, properties of pigmented coatings, typical formulations, clear and grease-resistant coatings and suggestions on operational methods.

Circle No. 45 on Readers' Service Card

The Paper Industry
Professional and Business Services

J. E. SIRRINE COMPANY
ENGINEERS Since 1902
GREENVILLE, SOUTH CAROLINA

Design — Consultations
Paper & Pulp — Reports
Water & Waste — Appraisals
Steam & Hydro Power — Steam Utilization

CLASSIFIED

NEW SLIMICIDE

(tributyl tin oxide complex)

Agents wanted to handle this new slime killer priced at $2.40 per lb. Every mill who have tried this unique material are now regular users. Paper mill personnel may act as agents in spare time. Inquiries will be held confidential. Write Box 672, The Paper Industry.

WANTED

Well established New England manufacturer of heavy equipment for the pulp and paper industry, needs a young sales engineer to be located in the lake states area. Should be graduate mechanical or chemical engineer, preferably with stock preparation background. Excellent salary. Adequate expense account. Car furnished. Send complete resume which will be kept confidential by our executives to Box 682, The Paper Industry.

WANTED

Two young mechanical engineering graduates are needed by a well known manufacturer of heavy machinery as resident sales engineers. Good salary, benefits and opportunities for advancement for ambitious young men. Fine living accommodations in a New England community in the heart of year-around recreational areas. Your resume will be kept confidential. Write to Box 683, The Paper Industry.

WE NEED EXECUTIVES
FLORIDA

South's largest wholesale paper distributor, second largest fully integrated paper company in the world, has financial strength, stability and is constantly expanding. We need top management, ability and experience, in wholesale paper applicable to the following areas:

1. Procurement, Box 684-A
2. Sales Promotion, Box 684-B
3. Market Analysis, Box 684-C
4. Branch Operations, Box 684-D

If organizing and coordinating your own department is appealing and you prefer working with a dynamic young management group in a growing firm, why not investigate.

Address: Box 684 (A, B, C or D), The Paper Industry

Please send resume of background and experience with recent photo. Remember, you will resume full responsibility for your department and must know the wholesale paper business.

WANTED
MECHANICAL DESIGN ENGINEERS

for plant layout work and automatic equipment. Board work involved. Pulp and Papermill experience helpful. Excellent opportunity for desirable applicant. State experience and salary details. Location south. Write Box 685, The Paper Industry.

PAPER MILL SALESMEN

We have openings for 2 experienced paper mill salesmen. One for the Southwest headquartering in or near Dallas — One for the Southeast headquartering in or near Richmond, Virginia.

These are most unusual opportunities to represent a mill manufacturing tailor made converting papers. Because of a major expansion program (new machine) which will more than double our sales, these 2 new territories with residence representation, are being established.

The men we are seeking should be acquainted with converters, particularly those using flexible packaging papers, envelope manufacturers, waxers and coaters, laminators and corrugators, and printers in graphic arts fields.

Please contact us direct by letter giving background and experience. All replies will be held in confidence.

Nicolet Paper Corporation — West De Pere, Wisconsin

CHEMICAL ENGINEERS
BOWATERS SOUTHERN PAPER CORPORATION

South's largest Newsprint Manufacturer has permanent positions available for Chemical Engineers. Mill's Technical Staff now being enlarged because of extensive program. Degree from accredited college required. Applicants with Pulp and/or Paper Mill experience will be given preference. Starting salary based on qualifications with periodic merit increases. Complete insurance, retirement, and vacation programs established. All replies will be answered and treated in confidence. Reply immediately submitting summary of experience to:

Industrial Relations Department
BOWATERS SOUTHERN PAPER CORPORATION
Calhoun, Tennessee

Exhaust Silencing and Water Separating in one unit

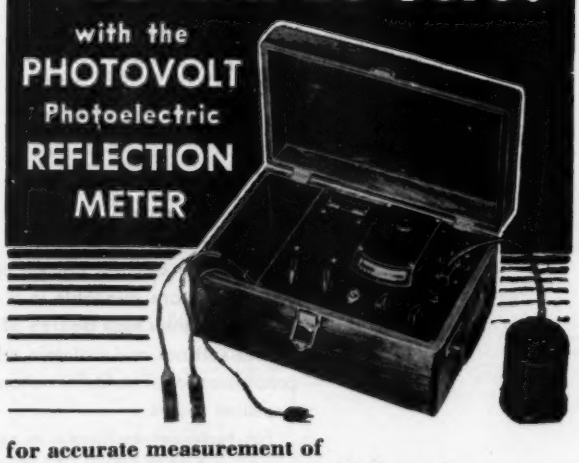
Water removal from the exhaust of water-sealed vacuum pumps has now been fully accomplished by the Burgess-Manning "WSS" Water Separator Snubber — and in the same snubber that silences the annoying roar created by the exhaust gases. It is done centrifugally. Water laden gases enter the side of the "WSS" and when processed the gases escape at the top and the water is expelled at the bottom. The "WSS" will accommodate water carrying a percentage of settlings and impurities. Standard units from 1¼" to 12" — units for unusual and corrosive conditions, or sizes over 12" designed special.

Ask for Bulletin No. 270

Sound Engineering

BURGESS-MANNING COMPANY
Industrial Silencer Division
9235 Sovereign Row, Dallas, Texas
Libertyville, Ill.

You Can Be Sure!
with the
PHOTOVOLT
Photoelectric
REFLECTION METER



for accurate measurement of
Brightness and Opacity
of pulp and paper in terms of TAPPI specifications.
Also for ***Gloss and Color***
tests on paper, cardboard, and other paper products.
Portable, reliable, rugged, simple to operate
Also: Colorimeters, pH Meters

PHOTOVOLT CORP.
95 MADISON AVENUE NEW YORK 16, N. Y.

Smears of size on glass show clarity of Ten-O-Film, right, almost invisible, compared with conventional starch, left.

Sure way to CLEAR, UNIFORM COATING

The highest degree of coating quality can be achieved with the new, improved Ten-O-Film starches.

These new starches possess unexcelled clarity, uniformity and film-forming properties. They are available in a series of fluidities to meet your exact requirements. Because of their high degree of viscosity stability at high solids, Ten-O-Film starches reduce setback and maintain adhesive strength, assure good performance. At lower concentrations Ten-O-Film starches assure superb structural film continuity and excellent results.

For technical assistance in selecting the TEN-O-FILM starch best suited to your needs contact our nearest sales office or write direct.

TEN-O-FILM® starches

Fine products for the Paper Industry: EAGLE® • FOXHEAD® • GLOBE® • TEN-O-FILM® and CLARO® starches. GLOBE® dextrines and gums.

CORN PRODUCTS SALES COMPANY 17 BATTERY PLACE, NEW YORK 4, N.Y.

MARKET QUOTATIONS

RAGS (Domestic)

New Cotton Cuttings

The following are brokers' and large dealers' average buying prices for sizeable lots in cents per pound f.o.b. New York:

	per cwt.
No. 1 white shirt cuttings	13.00— 13.50
Soft unbleached muslins	15.50— 16.00
Fancy shirt cuttings	4.50— 5.00
No. 1 percales	5.50— 6.00
No. 1 washables	2.25— 2.50
No. 1 light sileslas	6.50— 7.00
No. 1 light prints	4.75— 5.00
Light flannelettes	6.50— 7.00
Cottonades	2.75— 3.25
Blue overall cuttings	6.75— 7.25
Blue cheviots	6.75— 7.25
Canton flannels, bleached	10.50— 11.00
Canton flannels, unbleached	10.50— 11.00
Osnaburg cuttings	9.50— 10.50
Underwear cuts, bleached	14.50— 15.00
Underwear cuts, unbleached	14.50— 15.00
Sun tan khaki cuttings	5.00— 5.50
American linen cuttings	6.75— 7.25

Cotton Rags

The following are prices, cents per pound, paid by dealers and brokers f.o.b. New York:

	per cwt.
No. 1 roofing (Chicago)	.90— .95
No. 2 roofing (Chicago)	.70— .75
Twos and blues, repacked	1.50— 1.75
Thirds and blues, repacked	1.50— 1.75
No. 1 whites, repacked	—
No. 1 whites miscellaneous	—
No. 2 whites, repacked	—
No. 2 whites, miscellaneous	—

RAGS (Foreign)

(ex dock New York City)

New Rags

per cwt.

New dark cuttings
New mixed cuttings
New light sileslas
Light flannelettes
Unbleached cuttings
New white cuttings
New light oxfords
New light prints
} Nominal

Old Rags

per cwt.

No. 1 white linens
No. 2 white linens
No. 3 white linens
No. 4 white linens
No. 1 white cottons
No. 2 white cottons
No. 3 white cottons
No. 4 white cottons
Extra light prints
Ordinary light prints
Medium light prints
Dutch blue cottons
French blue cottons
French blue linens
Checks and blues
Linsey garments
Dark cottons
Old shopperies
} Nominal

ROPE and BAGGING

F.o.b. and ex dock New York City

Gunny No. 1, domestic	—
Gunny No. 1, foreign	—
No. 1 manila rope, domestic	—
No. 1 manila rope, foreign	—
New burlap cuts (soft)	—
Sisal strings	—
Mixed strings	—

WASTE PAPER

The following are prices, dollars per net ton, paid by brokers and large dealers for carload quantities of baled stock, f.o.b. cars New York:

No. 1 hard white envelope cuttings	85.00— 95.00
No. 1 hard white shavings	75.00— 80.00
No. 1 soft white shavings	50.00— 55.00
Soft white shavings, uncoated	60.00— 65.00
Fly leaf shavings No. 1	30.00— 32.50
Fly leaf, woody, No. 1	25.00— 27.50
Mixed colored shavings	21.00— 23.00
No. 1 books and magazines	29.00— 30.00
Ledger stock, white, No. 1	52.50— 55.00
Ledger stock colored, No. 1 (Midwest ship)	35.00—37.50
New manila envelope cuttings (free of groundwood)	70.00— 75.00
New manila envelope cuttings (containing groundwood)	50.00— 55.00
Manila tab cards	75.00— 80.00
Colored tab cards	55.00— 60.00
New northern kraft envelope cuttings	65.00— 70.00
Triple sorted kraft, 100%	35.00— 37.50
No. 1 old kraft	30.00—
White news cuts, No. 1	55.00— 60.00
No. 1 overissue news	17.00— 19.00
Folded news, special	15.00— 16.00
Folded news, ordinary	13.00— 14.00
Old corrugated boxes	22.00— 23.00
New jute corrugated cuts	19.00— 20.00
Mill wrappers	11.00— 13.00
Boxboard cuttings	7.00— 9.00
No. 1 mixed paper	10.00— 12.00

CHEMICALS

F.o.b. New York City

Alum, ammonium	
Granular, bags, works, cwt.	4.30—
Lump, drums, works, cwt.	5.05—
Powdered, drums, works, cwt.	5.20—
1-Arginine, drums, kilo	90.00—
Blanc Fixe	
Direct process, bags, c.l., works, ton	145.00—
L. c. l., ton	155.00—
Bleaching Powder, drums, cwt.	—
Casein, domestic acid precipitated	
30-mesh bags, 10,000-lb. lots or more, shipping point, lb.	.56—
80-mesh bags, 10,000-lb. lots or more, shipping point, lb.	.64—
China Clay, domestic dry-ground, airfloat, 99%	
325-mesh bags, c.l., Georgia works, ton	10.00— 12.00
300-mesh bags, c.l., Georgia works, ton	13.50— 14.50
Imported, white, lump, bulk, c. l., ex dock Phila, Portland, Me., gross ton	20.00— .35.00
Chlorine, liquid	
Tanks, single units, works, freight equaled, cwt.	3.15—
Glycerine, refined (CP, USP) 98%, drums c. l., delivered lb.	.29⅜—
Litharge, commercial powdered	
Barrels, c. l., works, freight equaled lb.	.13¾—
Rosin, gum, c. l., f.o.b. New York, cwt.	
K, M	9.75—
N	9.80—
WG	9.85—
WW	10.40—
Rosin, wood, c. l., f.o.b., shipping point, cwt.	
K, M	8.75—
N	8.95—
WG	9.15—
WW	9.45—
Saltcake, domestic, bulk works, 100% Na_2SO_4 basis ton	28.00—
Soda Ash	
Dense, 58%, paper bags, c.l. works, cwt	1.90—
Light, 58%, paper bags, c.l. works, cwt	1.85—
Soda, caustic	
Flake, 76%, drums, c. l. works, freight equalled, cwt	5.20—
Solid, 76%, drums, c. l. works, cwt.	4.80—
Sodium Silicate	
40°Be, 1:3.2, turbid, drums, c. l., works, cwt.	1.55—
52°Be, turbid, 1:2.4, drums, c. l., works, cwt.	2.65—
Starch	
Pearl, 140-lb. bags, cwt.	7.51—
Pearl, 100-lb. bags, cwt.	7.36—
Powdered, 100-lb. paper bags, cwt.	7.48—
Sulfur, crude	
Bulk, c. l. mine, contract, long ton	23.50—
Talc	
Domestic, fibrous, N. Y., grd., bags, c. l. works, ton	28.00—
Canadian, ground, bags, c. l. works, ton	20.00— 35.00
Titanium Pigment	
Calcium-rutile base, regular, bags, c. l., lb.	.09⅜—
High-tinting, drums, c. l., lb.	.14⅜—
Zinc Oxide Pigment, American process	
Lead-free, bags, c. l. freight allowed, lb.	.14½—
Leaded, 35%, bags, c. l., freight allowed, lb.	.15⅛—

WOOD PULP

Quotations on domestic and Canadian pulp, dollars per short air-dry ton delivered consuming mills including basic allowances, follow:

Bleached sulfite, No. 1	155.00—
Bleached sulfite, Canadian	155.00—
Unbleached sulfite	135.00—
Unbleached sulfite, Canadian	135.00—
Bleached soda	150.00—
Bleached soda, Canadian	150.00—
Kraft, bleached hardwood	152.00—
Kraft, bleached	157.00—
Kraft, bleached southern	160.00—
Kraft, bleached Canadian	160.00—162.50
Kraft, unbleached southern	120.00—
Kraft, unbleached, Far West	125.00—
Kraft, unbleached Canadian eastern	135.00—
Kraft, unbleached Canadian western	120.00—125.00
Kraft, semi-bleached southern	140.00—
Sulfite screenings	—
Sulfate screenings	—

Quotations on imported wood pulp, dollars per short air-dry ton on dock American Atlantic ports, follow:

Bleached sulfite, Swedish, freight allowed	155.00—
Bleached sulfite, Norwegian, del'd with limited freight allowance	155.00—
Bleached sulfite, Finnish, freight allowed	155.00—
Unbleached sulfite, Swedish, freight allowed	135.00—
Unbleached sulfite, Finnish, freight allowed	135.00—
Kraft, unbleached, Swedish, freight allowed	125.00—
Kraft, unbleached, Finnish, freight allowed	125.00—
Kraft, bleached, Swedish, on dock	157.50—162.50
Kraft, bleached, Norwegian	155.00—

PAPER

Quotations are mill quotations Chicago

Boards (prices per ton, delivered in Chicago, 10 tons or more):	
Plain chip	107.50
News vat lined chip	110.00
.009 chip, rolls	100.00
Filled news	111.50
Solid news	114.50
White vat lined chip	144.50
Chip tube and can stock	112.50
Single manila lined chip	162.50
Single jute lined chip	147.50
Container, 42-lb.	
Kraft liner (per 1000 sq. ft.)	2.68
White patent coated	
.020	175.00
.018	177.50
.016	182.50

Book Paper (f.o.b. Chicago, c.l. cases per cwt):	
No. 1 enamels	20.55
No. 2 enamels	19.55
Machine-coated, 45- to 100-lb.	15.55— 19.00
60-lb. + uncoated offset, 25 × 38 (2000 lb.)	22.25
"A" grade English finish untrimmed, 25 × 38 (2000 lb.)	21.10
Rag Content Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons):	per cwt
100% rag	—
75% "	—
50% "	—
25% "	—
Rag Content Ledger (white, 5000 to 10,000 lb., ream sealed cartons):	
100% rag	—
75% "	—
50% "	—
25% "	—
Sulfite Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons):	
No. 1	—
No. 2	—
No. 4	—
Sulfite Ledger (white, 5000 to 10,000-lb., ream sealed cartons):	
No. 1	—
No. 2	—
No. 4	—

Newsprint (contract base price)	per ton
Rolls, standard	135.00
Sheets	Standard differentials

Kraft Wrapping — Natural (standard rolls 9- and 15-in. diam.)	per cwt
70-lb. and heavier	8.50
60-lb.	8.75
50-lb.	9.00
40-lb.	9.25
35-lb.	9.75
30-lb.	10.50
25-lb.	11.25
20-lb.	12.25
No. 1 Kraft Butcher — Pink	per cwt
40-lb. only	10.00
(Sheets — Plus 50c cwt)	

Safety . . .
(Continued from page 338)

International Paper Co., Livermore Falls, Maine; National Vulcanized Fibre Co. (Marshall Bros. Mill), Yorklyn, Del.; International Paper Co., Riley, Maine; Charmin Paper Products Co., Little Rapids, Wis.; American Writing Paper Corp. (Mt. Tom Div.), Holyoke, Mass.; Container Corp. of America (Western Container Div.), Tacoma, Wash.

Division II—Paper Converting

Paper Bags

Union Bag-Camp Paper Corp., Richmond, Va.; Virginia-Carolina Chemical Corp., Atlanta, Ga.; Crown Zellerbach Corp. (Gaylord Container Corp. Div.), Bogalusa, La.; Orange Pulp & Paper Mills Inc., Orange, Texas; St. Regis Paper Co., Nazareth, Pa.; Thilmany Pulp & Paper Co., Kaukauna, Wis.; St. Regis Paper Co., Los Angeles, Calif.; St. Regis Paper Co., San Leandro, Calif.; Pillsbury Mills Inc., Wellsburg, West Va.; Longview Fibre Co., Seattle, Wash.; St. Regis Paper Co., Ltd., Dryden, Ont.; Racquette River Paper Corp. Inc., Potsdam, N. Y.; St. Regis Paper Co., Playa Ponce, P. R.

Boxes and Cartons

Group A

Container Corp. of America, Philadelphia (Manayunk), Pa.; Container Corp. of America, Anderson, Ind.; General Foods Corp. (Carton & Container Div.), Battle Creek, Mich.; Container Corp. of America, Los Angeles, Calif.; Great Lakes Box Co., Cleveland, Ohio; International Paper Co., Wooster; New Haven Board & Carton Co., Illchester, Md.; Crown Zellerbach Corp. (Gaylord Container Corp. Div.) Baltimore, Ohio; Container Corp. of America, Boston, Mass.; Robertson Paper Box Co. Inc., Montville, Conn.; Container Corp. of America, Valley Forge, Pa.; Hankins Container Co., Cleveland, Ohio; American Can Co. (Marathon Div.), Modesto, Calif.; Green Bay Box Co., Green Bay, Wis.; Fonda Container Co. Inc., St. Albans, Vt.; Consolidated Water Power & Paper Co., Wisconsin Rapids, Wis.

Group B

Hankins Container Co., Union, N. J.; Container Corp. of America (Boyle Ave.), Los Angeles; Container Corp. of America (Container Div.), Chattanooga, Tenn.; International Paper Co., Kansas City, Kansas; Olin Mathieson Chemical Corp., Cincinnati, Ohio; Container Corp. of America, Rock Island, Ill.; International Paper Co., Kalamazoo, Mich.; Mengel Co., Fulton, N. Y.; Container Corp. of America, Santa Clara, Calif.; Crown Zellerbach Corp. (Gaylord Container Corp. Div.), Milwaukee, Wis.; Superior Paper Products Co. Inc., York, Pa.; Mengel Co., Nashville, Tenn.; Container Corp. of America (Container Div.), Chattanooga, Tenn.; Dairypak Inc., Clinton, Iowa; International Paper Co., San Jose, Calif.; Crown Zellerbach Corp. (Gaylord Container Corp. Div.), St. Louis, Mo.

Fibreboard Paper Products Corp., Antioch, Calif.; Container Corp. of America, Fernandina Beach, Fla.; Mengel Co., Winston Salem, N. C.; Container Corp. of America, Baltimore, Md.; Hoerner Boxes Inc., Fort Worth, Texas; Crowell Corp., Marshall, Mich.; Owens-Illinois Glass Co., Bradford, Penn.; Pollock Paper Corp., Dallas, Texas; Fort Wayne Corrugated Paper Co., Pittsburgh, Penn.; Hankins Container Co., Little Rock, Ark.; Hankins Container Co., Chicago, Ill.; Weyerhaeuser Timber Co. (Kieckhefer-Eddy Div.), St. Louis, Mo.; Container Corp. of America, Boston, Mass.; Weyerhaeuser Timber Co. (Kieckhefer-Eddy Div.), Belleville, Ill.; Crown Zellerbach Corp. (Gaylord Container Div.), San Antonio, Texas; Hunt Crawford Co., Coshocton, Ohio; Container Corp. of America, Muskogee, Okla.; Wilson Paper Co. Inc., Richmond, Va.; Dairypak Inc., Athens, Ga.; International Paper Co., Bastrop, La.; Container Corp. of America, Renton, Wash.; American Can Co. (Marathon Div.), Newman, Ga.; Container Corp. of America, Portland, Ore.

Weyerhaeuser Timber Co. (Kieckhefer-Eddy Div.), Yakima, Wash.; Weyerhaeuser Timber Co. (Kieckhefer-Eddy Div.), Detroit, Mich.; Olin Mathieson Chemical Corp., West Monroe, La.; Dairypak Inc., Cleveland, Ohio; St. Regis Paper Co. (Niagara Carton Container Div.), Buffalo, N. Y.; International Paper Co., Geneva, N. Y.; International Paper Co. (Single Service Div.), Waco, Texas; International Paper Co., Geneva, N. Y.; Weyerhaeuser Timber Co. (Kieckhefer-Eddy Div.), Hastings, Neb.; Weyerhaeuser Timber Co. (Kieckhefer-Eddy Div.), Garland; Weyerhaeuser Timber Co. (Kieckhefer-Eddy Div.), Longview, Wash.; Fiberboard Paper Products Co., San Joaquin, Calif.; Weyerhaeuser Timber Co. (Kieckhefer-Eddy Div.), Seymor, Ind.; International Paper Co., Auburndale, Fla.; Weyerhaeuser Timber Co. (Kieckhefer-Eddy Div.), Carpentersville, Ill.; International Paper Co., Mason; International Paper Co., Houston, Texas; Container Corp. of America, Sioux City, Iowa.

Roofing Paper

Flintkote Co., East Rutherford Plant; United States Gypsum Co., South Gate, Calif.; Ruberoid Co., Mobile, Ala.; Ruberoid Co., Gloucester City, N. J.; Ruberoid Co., Dallas, Texas; United States Gypsum Co., Jersey City, N. Jersey; Ruberoid Co., Savannah, Ga.; Bird & Son Inc., Charleston, South Carolina; Ruberoid Co., Erie, Pa.; Certain Teed Products Corp., Dallas, Texas; Ruberoid Co., Erie, Pa.; Ruberoid Co. (Erie Lake), Erie, Pa.; Ruberoid Co., Millis, Mass.; Certain-Teed Products Corp., Kansas City, Mo.; Johns Manville Corp., Marrero, La.

Murray Brantford Roofing Co., Brantford, Ont.; Ruberoid Co., Baltimore, Md.; Ruberoid Co., Denver, Colo.; Celotex Corp., Cleveland, Ohio; Canadian Gypsum Co. Ltd., Mt. Dennis Pl.; Fibreboard Paper Products Co., Portland, Ore.; Fiberboard Paper Products Co., Wilington, Calif.; Murray Brantford Roofing Co., St. John, N. B.; Murray Brantford Roofing Co., Thorold, Ont. Certain-Teed Products Corp., Tacoma, Wash.; Murray Brantford Roofing Co., Lachine, Plant.

Insulation and Building Board

National Gypsum Co., Mobile, Ala.; U. S. Gypsum Co., Greenville, Miss.; Flintkote Co., Meridian Plant; Abitibi Corp., Alpena, Mich.; Kaiser Gypsum Co., St. Hellens, Ore.; U. S. Gypsum Co., Pilot Rock Plant; Canadian Johns Manville Co., Ltd., N. Bay, Ont.; U. S. Gypsum Co., Lisbon Falls, Maine; Flintkote Co., Linden, N. J.

Specialties

Lily Tulip Cup Corp., Augusta, Ga.; Crown Zellerbach (Western Waxide Div.), Los Angeles, Calif.; Orchard Paper Co., St. Louis, Mo.; St. Regis Paper Co., Kalamazoo, Mich.; Gummed Products Co., Troy, Ohio; Crown Zellerbach (Western Waxide Div.), St. Louis; Scott Paper Co., Sandusky, Ohio; Kimberly Clark Corp., Appleton, Wis.; Kimberly Clark Corp., Winnipeg; Crown Zellerbach (Western Waxide Div.), Kansas City, Kansas; Container Corp. of America (Sefton Fibre Can Div.), Jefferson, Ind.; Pollock Paper Corp., Seattle, Wash.; Pollock Paper Corp., San Jose, Calif.; Pollock Paper Corp., Houston, Texas.

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Johnson Joints fit all needs on paper machines, calenders, corrugators, waxers, embossers, roofing machines, printing presses. For full data on Type LN write for Bulletin N-2002.

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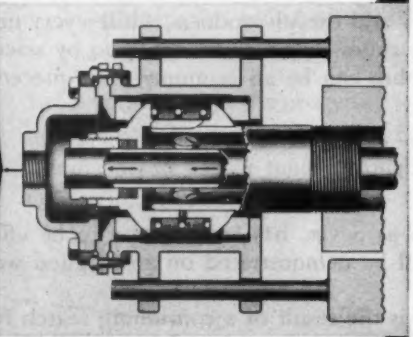

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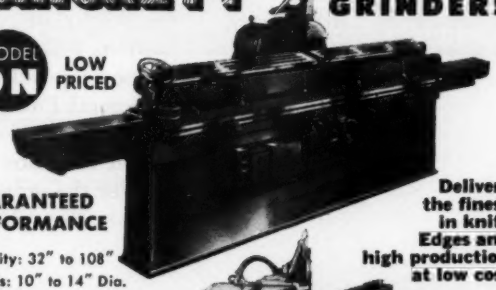

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The double-solution method, consisting of an acid wash (not to exceed 10 per cent hydrochloric acid) followed by an alkali-detergent wash, is recommended for cleaning felts where rosin size is a major factor contributing to felt plugging.

The insoluble aluminum rosinate, which is responsible for the plugging effect, is converted by HCl in step 1 to rosin acid and aluminum chloride, while in step 2 the rosin acid is converted by sodium carbonate into a rosin soap which is easily removed from the felt.

Paper mill packing troubles

Packing troubles resulting from the expansion and tightening of the packing when subjected to heat can be remedied by the use of a so-called "metallic packing" which has the advantage of retaining its constant volume under all conditions of temperature.

Cyanoethylated paper

Cyanoethylated kraft paper, manufactured by Hollingsworth & Vose, and used in General Electric's Permalex insulation, permits a 20 per cent increase in peakload rating without sacrifice in life expectancy, according to a General Electric report.

The paper also shows improved resistance to heat deterioration and longer retention of dielectric and tensile strength. The term cyanoethylation implies the substitution of the hydroxyl groups in the cellulose chain with more stable cyanoethyl groups.

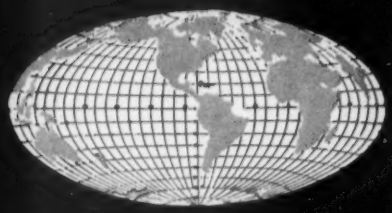
Science and industry in partnership

Industry is turning more and more to science in its search for ways to more profitable operations. Industry needs scientific discoveries in order to translate these into technology and useful products, while every new advance in technology opens new avenues that may be explored by science. The only result of such a partnership can be an economy of unprecedented abundance.

New chemical against Gypsy Moth

A new chemical, known as Sevin, has been shown to be effective against the Gypsy Moth and will be demonstrated on an infested woodlands area of about 75,000 acres.

The choice of Sevin is the result of a continuing search for insecticides that can be used with a minimum hazard to fish and wildlife, and without long-lasting residues that could contaminate forage and food supplies.



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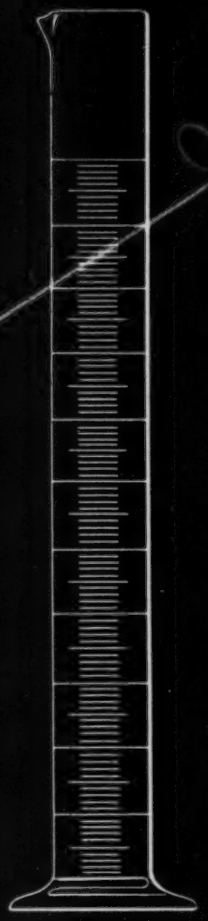

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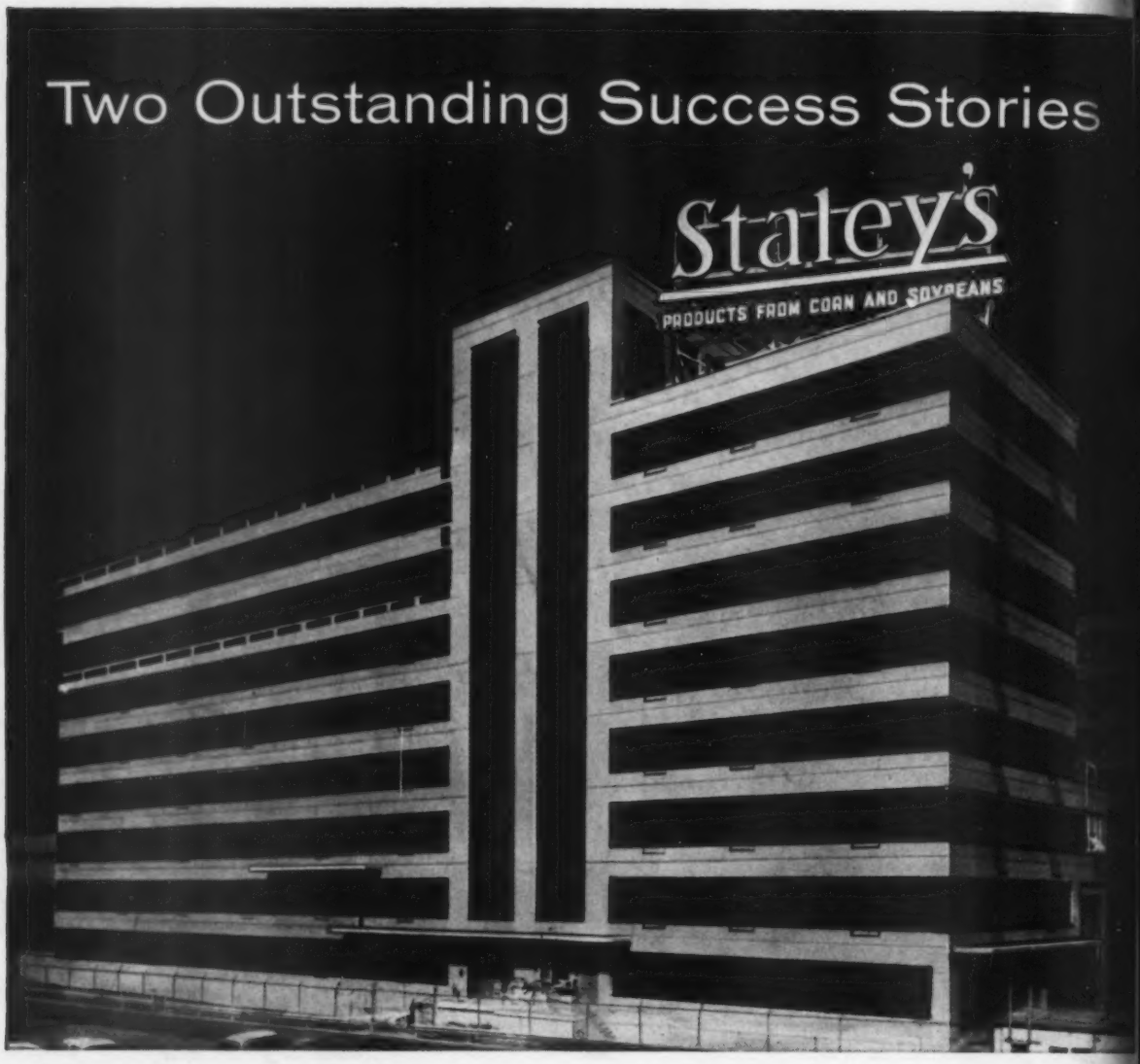

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